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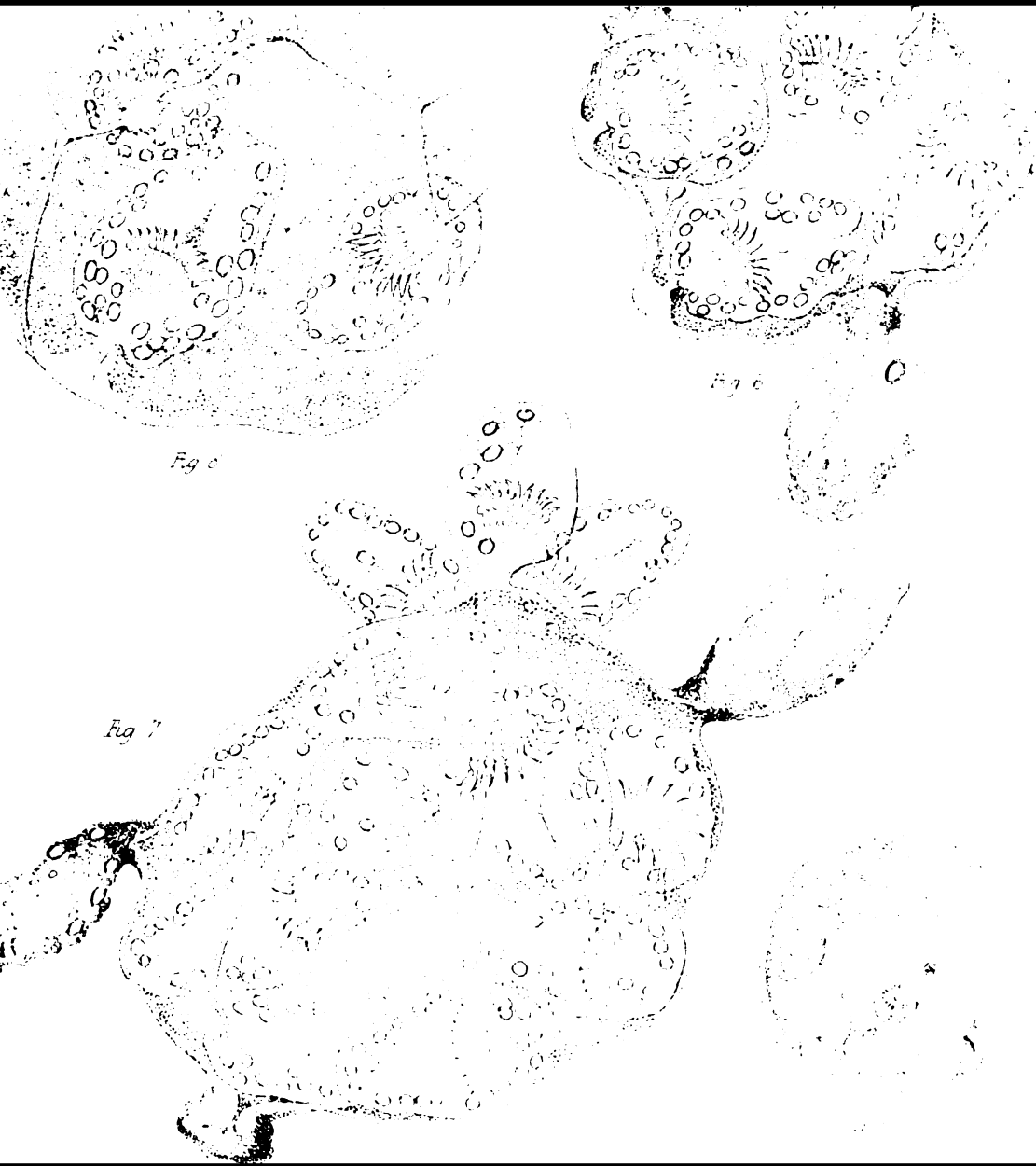
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Proceedings

Zoological Society of London



Harry Berkeley James.

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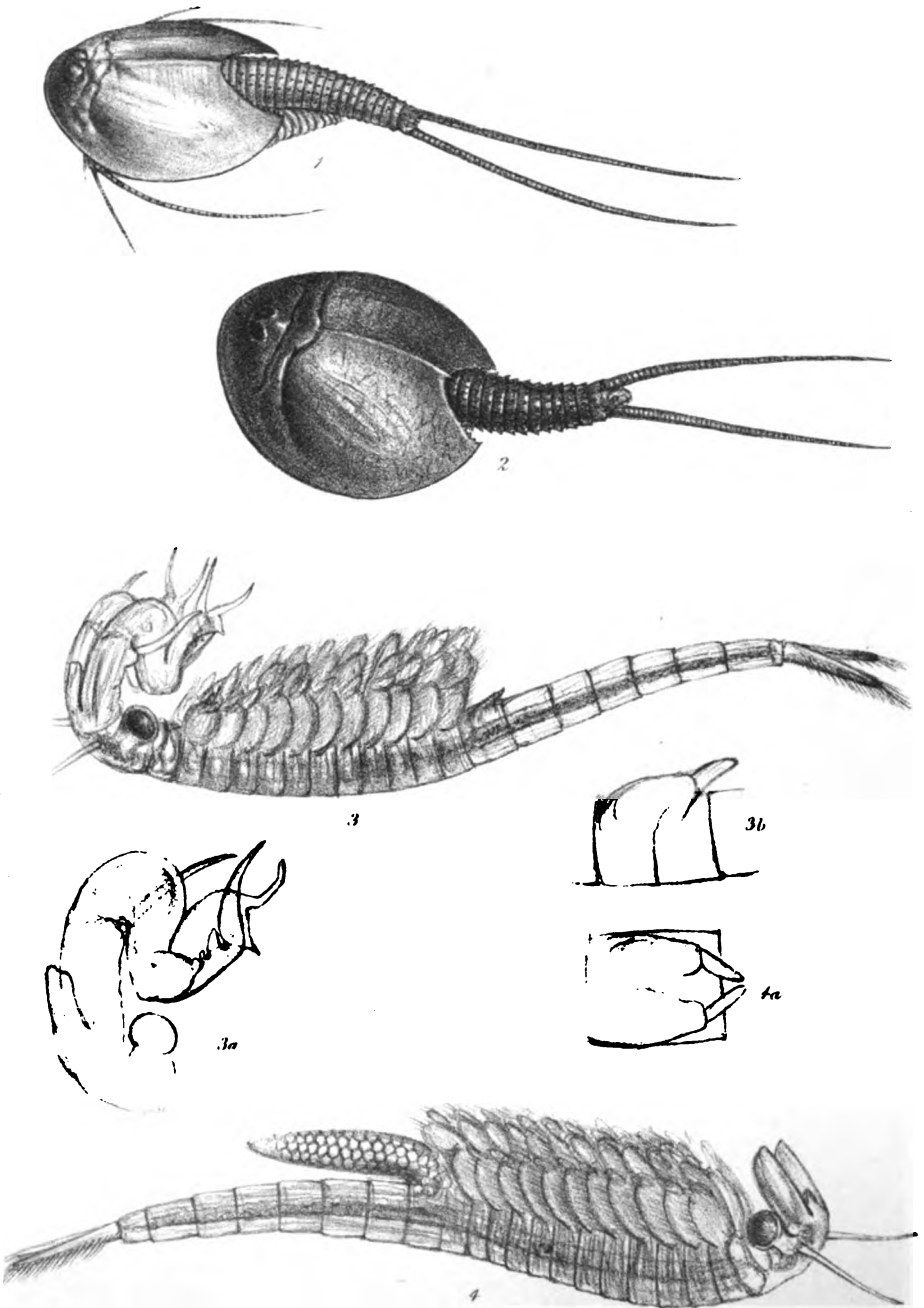
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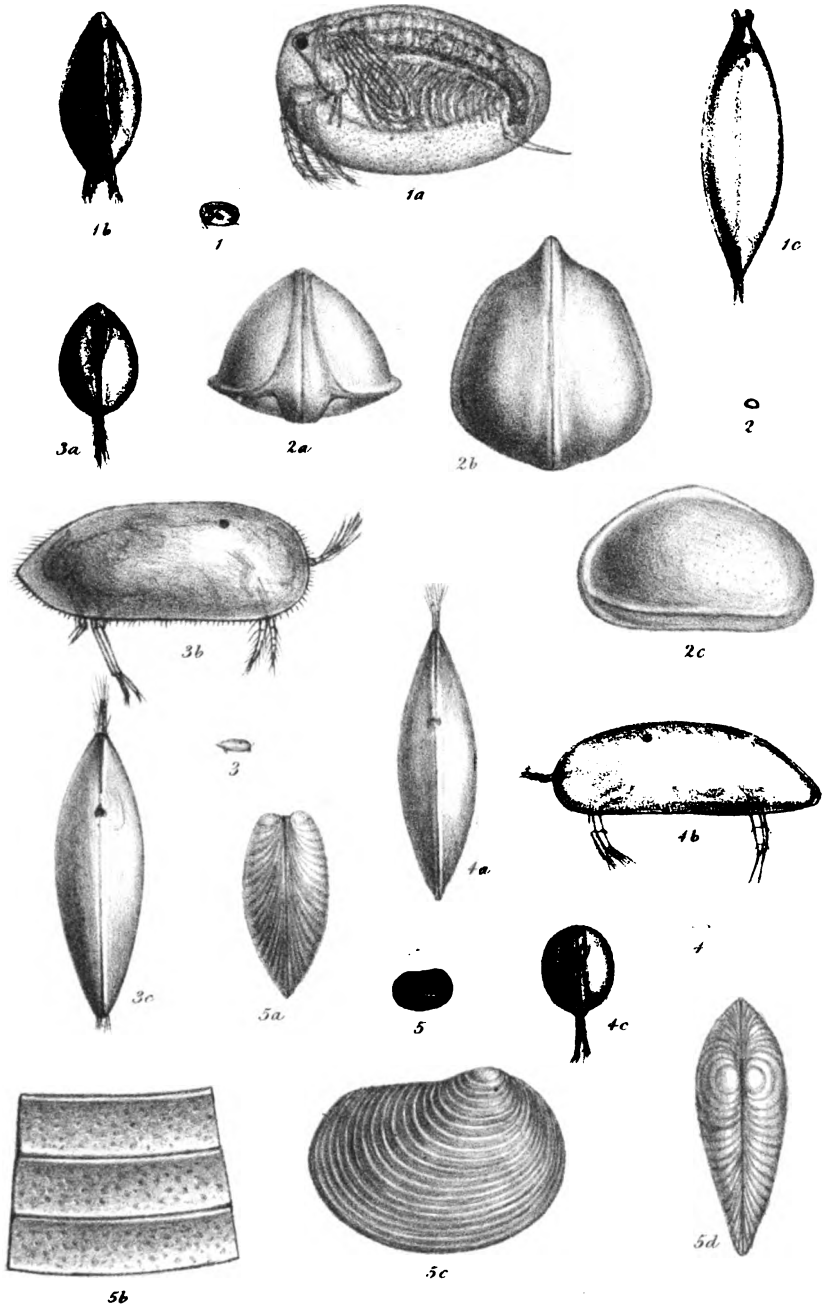
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1 *Apus domingensis* 2 *Lepidurus glacialis* 3-4 *Streptocephalus similis*



1 *Limnadia antillarum* 2 *Cypris cuneata* (?) 3 *Cypris Schomburgkii*
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PROCEEDINGS
OF THE
ZOOLOGICAL SOCIETY OF LONDON.

January 13, 1852.

W. Yarrell, Esq., in the Chair.

The following papers were read :—

1. **MONOGRAPH OF THE FAMILY APODIDÆ, A FAMILY OF CRUSTACEANS BELONGING TO THE DIVISION ENTOMOSTRACA ; WITH A DESCRIPTION OF A NEW SPECIES OF APUS, AND TWO SPECIES OF OSTRACODA BELONGING TO THE GENUS CYPRIIS. BY W. BAIRD, M.D., F.L.S. ETC.**

(Annulosa, Pl. XXII. XXIII.)

IN drawing up this communication, one of the objects I had in view was to call the attention of the members of this Society to a group of animals which must be very numerous, especially in warm climates, but which nevertheless have been but little attended to. The animals to which I propose directing your attention belong to that very interesting division of the great class CRUSTACEA, called ENTOMOSTRACA. The chief interest attached to these creatures, most of which are very small, is derived from watching their gambols in their native element, and examining by the aid of the microscope the wonderful beauty of their various organs, especially their organs of motion and breathing. Unfortunately few naturalists, comparatively speaking, have paid much attention to them, and collectors of objects of Natural History have generally, perhaps from their minuteness, overlooked them almost entirely. Those however who have watched these little creatures, whether sporting in the freshwater ponds and lakes of the interior, or illuming the bosom of the ocean with their brilliant phosphorescent light, have not failed to be struck with the beauty and elegance of their forms,—a beauty and elegance which it is difficult to describe, and the attempt to do which has caused the grave naturalist Otho Fredericus Müller involuntarily to rise into the language of poetry.

No. CCXXXVIII.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

The largest species of *Entomostraca* belong to the order *Phyllopoda*, and the beauty of their movements through the water and the symmetry of their various organs of motion are truly exquisite. The family *Apodidae* contains the largest individuals, though as yet the number of species described is not great. One species of the family was known to Linnæus, who mentions, in the first edition of his 'Fauna Suecica' (1746), having seen a specimen in 1728 at the house of a naturalist in London, who told him he had received it from Prussia. Jacob Frisch * had, previously to the publication of the 'Fauna Suecica,' made known and figured a species, specimens of which he had received from Klein, then at Dantzic, who had found it in East Prussia. Specimens of this species were sent soon afterwards by Klein to London to Sir Hans Sloane, and at the very same time (1738) this species was found also in England in a pond on Bexley Heath by the Rev. Lyttleton Brown. Klein's notice, previously sent to Sir Hans Sloane, and Mr. Brown's description, were published simultaneously in the 'Philosophical Transactions' of that year. Several species have since then been discovered, natives of various parts of the globe and having a wide geographical range. They have been found in different parts of Europe, in North Africa, in North America, even as high as the borders of the Arctic Ocean, in the West Indies, and in Australia.

The Family *Apodidae* (belonging to the Order *Phyllopoda*) may be thus characterized :—

Pedes branchiales, paribus sexaginta. Antennæ breves, styliformes, pari singulo. Oculi duo, sessiles. Corpus numerosè articulatum, parte majore clypeo magno obtectum.

The feet, consisting of 60 pairs, are all formed for the purpose of breathing with, and not for locomotion, the first pair alone being provided, in addition to the branchial plates, with organs adapted for assisting the animal in swimming. The first pair are the largest, and after the second pair they become gradually smaller as they descend, until the last few pairs become almost obsolete. The animals generally swim on their back, and these branchial feet are in constant motion even when the animal is at rest. The body is cylindrical, elongated, consisting of numerous segments, and the upper half, or more in some species, is covered by a large shield-shaped carapace or buckler. This carapace protects the vital parts, and is furnished with a peculiar structure in its substance for increasing the extent of its branchial apparatus. The antennæ are small organs and in number only one pair, short and styliform. The eyes are two in number, compound, lunate-shaped, and are sessile, being placed on the upper and central portion of the carapace. The young have only one eye, which gradually disappears as moulting goes on, until the mark merely remains. This is generally described as a third eye, but according to Zaddach the two compound eyes only are provided with optic nerve, pigment and cornea. The caudal segment of the body gives off two long and very numerous articulated cylindrical setæ or filaments which are more or less provided with short hairs from each side.

* Insecten in Deutschland, 1732.

Only one genus of this family is recognized by M. Milne-Edwards in his work on the Crustacea, though Dr. Leach had many years ago established a second; the character upon which that genus was founded by Leach is not considered by M. Edwards as of generic importance; but having observed another character equally remarkable, which occurs in all the known species of the group which that genus represents, I consider Leach's genus ought to be adopted, and I now propose giving the characters of the two genera at greater length than they have yet been done.

Genus APUS, Scopoli.

Clypeus corneo-coriaceus. Corpus molle, cylindricum. Segmentum caudale lamina producta non instructum. Pedum primi paris appendices, aut rami, longissimi, flexibiles.

In the genus *Apus*, the tail-segment of the body is rounded, and has no plate or prolonged appendage between the two long setæ or filaments. The first pair of feet are very long, dividing into three cylindrical branches, the external one of which is very long, in some species equalling in length the whole body with the tail filaments included: they are very flexible, possess much motion, and are very conspicuous. These organs at once distinguish the genus, and they possess the same general character in all the species hitherto known. Four species have only as yet been described, and I now propose to add to that number a fifth.

1. APUS CANCRIFORMIS, Schæffer. *Clypeo corporis plusquam dimidiam partem tegente, ovato, olivaceo, corneo; ramo externo pedum primi paris longitudine clypeum æquante.*

Long. tot. corporis $2\frac{1}{2}$ poll.; lat. clypei $1\frac{1}{2}$ poll.

Pro Synonymis vide "Baird's Nat. Hist. of the British Entomostaca, Ray Society's Publications, 1850."

Hab. In Europa; detecta in Anglia, Gallia, Borussia, &c. In Africa Septentrionali; detecta in Tunisia, collegit Dominus L. Frazer; in Algeria, collegit M. Lucas. Museum Britannicum.

The colour of this species is brownish yellow or olive clouded with marks of a deeper hue. The carapace is oval and extends over nearly two-thirds of the body of the animal. The keel which runs down the centre of the carapace is pretty strong, and the deep notch at the posterior extremity is lunated in shape and has its edges finely toothed. The external branch of the first pair of feet is about the length of the carapace, while the caudal setæ are nearly as long as the whole body, and are covered with numerous short hairs. The abdominal portion of the body not covered by the carapace is studded all over with circular rows of stout hooked spines of a dark brown colour.

2. APUS GUILDINGII, Thompson. *Clypeo corporis vix dimidiam partem tegente, quadrato, membranaceo, nigrescente; ramo externo pedum primi paris longissimo, totum corpus, filamentis caudalibus inclusis, excedente.*

Apus Guildingi, Thompson, Zoological Researches, Fasc. v. 108. t. 6. f. 3; M. Edwards's Hist. Nat. Crust. iii. 561.

Hab. In Insula "St. Vincent's," India Occidentali ; *Rev. Lansdowne Guilding*.

Mr. Thompson in his 'Zoological Researches' remarks: "I received this species of *Apus* together with the *Artemis Guildingi* from the West Indies, and having as yet no details, must leave its history in the hands of its distinguished discoverer. It is of a light blackish colour, the clypeus translucent, almost membranous, and shorter in proportion than in any of the known species, with the extreme branch of the anterior member extremely long." Unfortunately we have no further history of this species from its discoverer the Rev. Lansdowne Guilding, but the short square-shaped carapace and the extreme length of the external branch of the first pair of feet sufficiently distinguish it.

3. *APUS LONGICAUDATUS*, Le Conte. *Clypeo corporis tertiam partem non multo magis tegente, rotundato, subfusco; ramo externo pedum primi paris longitudine clypeum excedente; corporis postica parte longissima, cylindrica.*

Long. tot. corporis 1.5 poll., clypei .65 poll.; lat. clypei .7 poll.

Apus longicaudatus, Le Conte, Ann. Lyc. Nat. Hist. iv. 155. t. 9.

Hab. In America boreali. "In a shallow lake on the high plateau between Lodgepole Creek and Crow Creek, N.E. of Long's Peak" (*Le Conte*).

This species is readily distinguished by the extraordinary length of the abdominal portion of the body. The carapace is rounded, somewhat truncated at the anterior extremity, and having the two extremities of the fork terminating in a very sharp point. It does not cover much more than one-third of the body, and is thin in substance. The external branch of the first pair of feet is long, exceeding considerably the length of the carapace. The caudal filaments are about the length of the abdomen. Mr. Le Conte says that the species was found in immense numbers in a small shallow lake on the high plateau between Lodgepole Creek and Crow Creek, N.E. of Long's Peak, near the Rocky Mountains. "They were swimming about with great activity, plunging to the bottom and rising to the surface."

4. *APUS OBTUSUS*, James. *Species hæc reperta a Domino James in "Major Long's Expedition to the Rocky Mountains," non satis bene descripta necnon delineata est.*

Long. clypei .3 poll.; lat. clypei .4 ? poll.

Apus obtusus, James, Expedition to the Rocky Mountains, ii. 336.

Hab. In America boreali. "Rain-water puddles on the Platte river, near the Rocky Mountains" (*James*).

This species is very briefly described by Mr. James. "In rain-water puddles," he says, "we remarked a new species of Branchiopode belonging to the genus *Apus*; small crustaceous animals, which exhibit a miniature resemblance to the King or Horse-shoe Crab (*Limulus polyphemus*) of our own sea-coast, but which are furnished with about 60 pairs of feet, and swim upon their back. The basins of water which contained them had been very much diminished by

evaporation and infiltration, and were now crowded to excess, principally with the *Apus*, great numbers of which were dying upon the surrounding mud, whence the water had receded. This species is distinguished from the *productus* of Bosc and *Montagui* of Leach, by not having the dorsal carina prolonged in a point behind; and from *cancriformis* by the greater proportional width of the thorax, and more obtuse emargination behind. The length of the thorax along the middle is three-tenths of an inch and its greatest breadth somewhat more. It may be named *Apus obtusus*.—Note 7. p. 336.

5. *APUS DOMINGENSIS*, Baird, sp. nov. (Tab. XXII. fig. 1). *Clypeo corporis dimidiam partem tegente, rotundo, tenui, corneo; ramo externo pedum primi paris corpus æquante.*

Long. tot. corporis 1 poll.; lat. clypei $\frac{1}{2}$ poll.

Hab. In Insula St. Domingo, India Occidentali. Collegit M. Sallé. Museum Britannicum.

Though a native of the West Indies, this species may be easily distinguished from *A. Guildingii* by its round-shaped carapace of a horny colour covering half the body of the animal, and its external branch of the first pair of feet only the length of the body, while in *A. Guildingii* it exceeds the whole body and caudal filaments included. The carina down the centre of the carapace, and the fork which it takes at the anterior extremity where the division into cephalic and thoracic portions takes place, are marked throughout their length with a deep brown colour, as are also the short stout spines on the abdominal portion of the body. These are straight, not hooked as in some of the other species. The caudal filaments are nearly the length of the body, and are covered with very numerous, extremely short setæ. The oviferous feet are present in all the specimens I have examined, but none contain any ova.

Genus *LEPIDURUS*, Leach.

Clypeus corneo-coriaceus. Corpus molle, cylindricum. Segmentum caudale lamina producta instructum. Pedum primi paris appendices, aut rami, brevissimi.

In the genus *Lepidurus* the tail-segment of the body, which in *Apus* is rounded, is furnished with a flap or plate of considerable size extending to some distance between the long setæ or filaments. The first pair of feet, compared with those of *Apus*, are extremely short and comparatively inconspicuous. These two characters at once distinguish the genus, of which only three species have as yet been described. In other respects it resembles perfectly the genus *Apus*.

Schæffer is the first author who has distinctly described any species belonging to the genus *Lepidurus*. Linnæus's description of the "*Monoculus cauda biseta*" in the first edition of the '*Fauna Suecica*,' will apply to either the *Apus* or *Lepidurus*. He quotes Frisch's figure, and states, as I have mentioned above, that he had seen a specimen in London. We might conclude from this that it was the *Apus cancriformis* he had in view; but in the second edition of the '*Fauna*' (1761), he distinctly mentions, in his brief descrip-

tion, that the tail was furnished with two long setæ, with a flap interposed between them. As in this edition he continues to refer to Frisch's figure, and adds that of Klein, in the 'Philosophical Transactions,' it is evident he confounded two species together; and as the *Lepidurus productus* (the *Apus productus* of authors) is perhaps the more common species of the two on the Continent, it is most probable that he had it in view when he wrote, but erroneously referred to the species figured by Frisch and Klein as identical with it.

The three species which have been described are—

1. **LEPIDURUS PRODUCTUS**, Bosc. *Clypeo corporis magis quam tres partes tegente, ovato, elongato, olivaceo-viridi; setis caudæ pennatis; lamina caudali elongato-ovata, carinata, setis brevibus numerosis obsita.*

Long. toti corporis $2\frac{1}{2}$ poll.; lat. clypei 1 poll.

Pro Synonymis vide M. Edwards, Hist. Nat. Crust. iii. 560.

Hab. In Europa; detecta in Gallia, Suecia, Borussia, &c. Museum Britannicum.

This species is of an olive-green hue, and is smaller than the *Apus cancriformis*. The carapace is of an oval form and covers more than two-thirds of the body. The notch at its posterior part is less deeply lunated than in *Apus cancriformis*, and the keel which runs down its centre is well-marked. The flap of the caudal segment is of an elongated oval shape and has a keel running down its centre, which, as well as its edges, are finely serrated, or beset with numerous short setæ. The tail-setæ are also furnished on each side with numerous short hairs, which, when magnified, present a fine plumose appearance. The first pair of feet or rami are very small, and when the animal lies prone are indistinctly visible.

2. **LEPIDURUS GLACIALIS**, Kroyer (Tab. XXII. fig. 2). *Clypeo corporis tres partes tegente, rotundato, viridi; setis caudæ plumosis; lamina caudali abbreviata, subquadrata, denticulata.*

Long. toti corporis 1 poll.; lat. clypei .5 poll.

Apus glacialis, Kroyer, Voy. en Scandinavie, Laponie, &c. t. 40. f. 1.

Hab. In America boreali; detecta ad "Cape Krusenstern" mense Augusti 1849. Collegit Dominus J. Rae. Museum Britannicum.

This species is smaller than the preceding, and of a green colour, having the carapace of a rounded form with a sharp keel running down the centre. It covers rather more than two-thirds of the body, and has the notch at its posterior extremity small and finely toothed on its edges. The spines on the body are small and of the same colour as the body itself. The first pair of feet or rami are very short, scarcely visible when the animal is in a prone position beyond the edge of the carapace. The tail-setæ are finely plumose, and the flap between them is of a somewhat square shape, short and toothed on its edges.

3. **LEPIDURUS VIRIDIS**, Baird. *Clypeo corporis magis quam dimidiam partem tegente, rotundato-ovali, viridi, valide carinata;*

setis caudæ brevi-pilosis ; lamina caudali ovali-lanceolata, carinata, denticulata.

Long. tot. corporis 2 poll. ; lat. clypei 1 poll.

Lepidurus viridis, Baird, Proceedings of Zool. Soc. 1850, t. 17. f. 1.

Hab. "Van Diemen's Land." Museum Britannicum.

This species resembles considerably the *Lepidurus productus*. It is two inches long, and has the tail-setæ nearly as long as the body. The carapace and whole body are of a fine green colour ; the carapace of a rounded oval form and covering about two-thirds of the body. The edges of the notch in the posterior part of the carapace are strongly toothed, and those of the inferior half of the carapace are very finely serrated. The keel running down the centre is well marked and projects a short way beyond the edge of the notch. The tail-setæ are beset with very numerous short hairs, and the flap between them is of an oval lanceolate form, and has the keel beset with short sharp spines and the edges finely serrated. The first pair of feet or rami only slightly extend beyond the edge of the carapace.

Spurious Species.

Apus caudatus, De Kay, Nat. Hist. New York, Part 6, Crustacea, p. 61.

In the Journal of the Academy of Sciences of Philadelphia for 1818, vol. i., Mr. Say describes a parasitic Crustacean living on the *Calianassa major* (a malacostracous Crustacean), found on the coasts of the Southern States of N. America and of East Florida. He names it the *Binoculus caudatus* ; and in the Nat. Hist. of New York, Mr. De Kay refers this species to the order *Phyllopora* and to the genus *Apus*, though he says, "I place it here with some hesitation." This animal being parasitic is no doubt referred by Say to the genus *Binoculus* of Geoffroy, (equivalent to the genus *Argulus*, and which must be placed in the order *Pæcilopoda*,) and not to the genus *Binoculus* of Leach, as De Kay supposes, which is the *Apus* of authors.

Order OSTRACODA.

Family CYPRIDIDÆ.

Genus CYPRIS.

1. *CYPRIS BELCHERI*, Baird (Tab. XXIII. fig. 4). *Testa lucente, albida, elongata, stricta, supra arcuata, infra sinuata ; extremitate anteriore latiore, margine compressa, rugata ; extremitate posteriore mucronata.*

Long. $\frac{1}{10}$ poll. ; lat. 1 lin.

Hab. — ? "From Sir E. Belcher's Collection, along with some freshwater shells from the islands of the Eastern seas." Museum Britannicum.

The carapace valves or shell is of an elongate and narrow form, having the anterior extremity considerably broader than the posterior, and flattened on the margin, which is marked with a good many raised-looking striæ, which give it a puckered appearance. The posterior extremity is pointed and acute. The upper margin of the carapace is

arched, while the under margin is sinuated. The valves of the carapace are convex in the centre and are of a shining white colour.

In form this species resembles considerably the *C. clavata*, Baird, Brit. Entomotraca, but is less club-shaped and more sharply pointed at posterior extremity.

2. *CYPRIS SCHOMBURGKII**, Baird. *Testa subviridi, hirsuta, puncturata, ovali; extremitate anteriore rotundata, marginis subcompressa; extremitate inferiore oblique-truncata et mucronata, antennis pedibusque brevibus, setis plumosis.*
(Tab. XXIII. fig. 3.)

Long. $\frac{1}{2}$ poll.; lat. $\frac{1}{10}$ poll.

Hab. In insula St. Domingo, India Occidentali. Collegit M. Sallé. Museum Britannicum.

The carapace valves or shell is of an oval form, with the anterior extremity rounded in front and having its margin rather flattened or compressed, the posterior extremity being obliquely truncated above and terminating in a sharp point. The carapace is of a whitish green colour and covered all round the edges with rough coarse hairs. The valves are convex on the centre and have their surface dotted all over with small dots or punctures. The antennæ and legs are apparently very short, and the setæ of both are shortly plumose.

This is the largest species of the genus I have yet met with, being about $\frac{1}{4}$ th of an inch in length. Mr. James, in his account of the Expedition to the Rocky Mountains, mentions his finding a *Cypris* along with the *Apus obtusus* rather more than one-fifth of an inch in length.

2. ON THE GENUS THALURANIA. BY JOHN GOULD, F.R.S.

It is now some years since I proposed the generic name of *Thaluranian* for the *Trochilus furcatus* and its near allies. This generic term having been adopted by the Prince of Canino and others, tends to show that the division is a good one, and hence a list of the species known up to the present time, with their native habitats, may not be uninteresting to the members at the present meeting. I would also take the present opportunity of laying before the Society a new and very beautiful species, which, as far as I am aware, is only to be seen in my own collection.

The species of this well-defined genus are—

THALURANIA FURCATA.

Hab. Cayenne, Demerara, and Brazil.

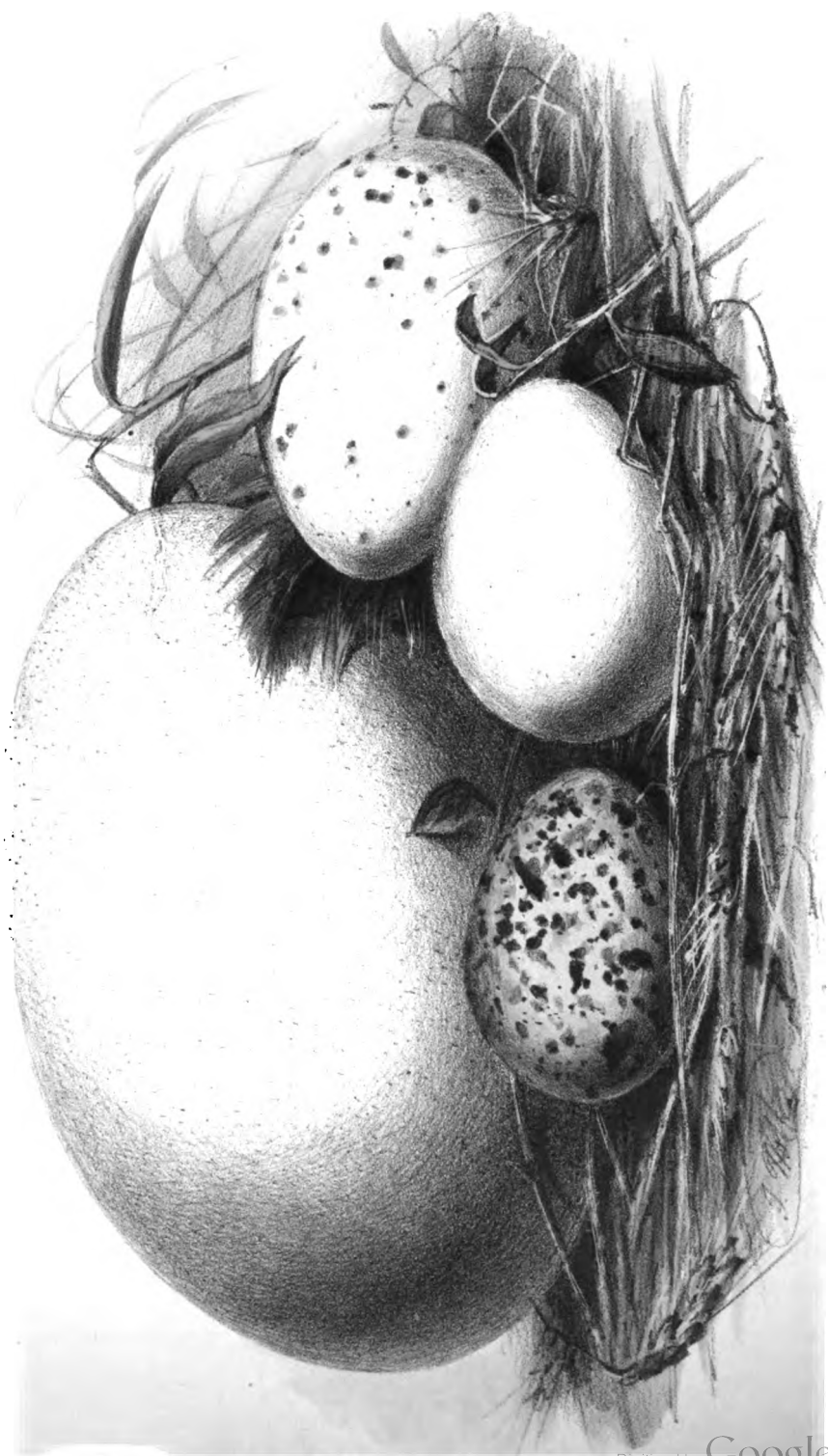
THAL. NIGROFASCIATA.

Hab. Woods on the banks of the Upper Amazon.

THAL. COLUMBIANA.

Hab. Temperate region in the neighbourhood of Bogota in Columbia.

* Named after Sir R. Schomburgk, British Consul in St. Domingo.



THAL. VENUSTA.

Inhabits Costa Rica and the southern portion of Mexico. The only species of the genus yet discovered to the north of Panama.

THAL. VIRIDIPECTUS.

A beautiful species lately sent to Europe from the Caraccas near to the Andes.

THAL. VERTICEPS.

A species found only in my own collection. It frequents the wooded regions on the west side of Pichincha in Ecuador. Sent to me by Mr. Jameson.

THAL. GLAUCOPIS.

Hab. South Brazil.

THAL. WATERTONI.

This is the largest species of the genus and a very beautiful bird.

Hab. Demerara.

THAL. WAGLERI.

Hab. The hilly regions of Brazil, particularly Minas Geraes.

THAL. ERIPHILE.

This species also inhabits Brazil, and is generally sent in collections from Rio.

THAL. REFULGENS, n. sp.

A species very like *furcatus* in colour, but nearly as large as *Watertoni*. The under tail-coverts are steel-black; crown of the head velvety black; breast and shoulders beautiful purplish blue; tail black and considerably forked; wings purplish brown; throat rich metallic green.

Hab. —?

January 27, 1852.

Professor Bell, F.R.S., in the Chair.

The following papers were read :—

1. NOTES ON THE EGGS AND YOUNG OF THE APTERYX, AND ON THE CASTS OF THE EGGS AND CERTAIN BONES OF *ÆPYORNIS* (ISID. GEOFFROY), RECENTLY TRANSMITTED TO THE ZOOLOGICAL SOCIETY OF LONDON. BY PROFESSOR OWEN, F.R.S., F.G.S., F.Z.S.

(Aves, Pl. XLVI.)

The Secretary placed upon the table casts of two eggs and of portions of the leg-bones of a gigantic bird of the Island of Madagascar, which had been presented by the Administration of the Garden of Plants in Paris to the Zoological Society of London, and on these Professor Owen made the following observations.

The casts were beautifully made and coloured, and were exact representations of the originals, which the Professor had examined during a visit to Paris in July last. These were received at the Garden of Plants in January last, and were described this day twelvemonth (January 27th) in a communication made by M. Isidore Geoffroy-St.-Hilaire to the Academy of Sciences *. They had been obtained by the master of a merchantman at the Island of Madagascar in 1850, from the natives, who stated that one of the eggs had been found, entire, in the bed of a torrent, amongst the debris of a land-slip: a second egg, with some fragments of bone, was subsequently found in a formation which is stated to be alluvial: a third egg, which the natives had perforated at one end, and used as a vessel, was also obtained. This egg was fractured in the carriage; the other two eggs arrived entire.

They are nearly of the same size, but differ in shape, one being shorter but a little thicker, and with more equal ends than the other. The following are admeasurements of these eggs and of an Ostrich's egg:—

	<i>Aepyornis.</i>		<i>Ostrich.</i>
	Ovoid egg.	Ellipsoid egg.	
Greatest circumference:	ft. in. lin.	ft. in. lin.	ft. in. lin.
Lengthwise	2 10 9	2 9 6	1 6 0
Breadthwise	2 4 3	2 5 6	1 4 6
Extreme length in a straight line	1 0 8	1 0 5	0 6 4

M. Isidore Geoffroy estimates the larger of the two eggs to contain $10\frac{1}{4}$ quarts, or the contents of nearly 6 eggs of the Ostrich, or 16 of the Cassowary, or 148 of the Hen, or 50,000 of the Humming Bird. The portions of bones of which casts were exhibited consist of the lower end of the right and left metatarsal bones and the upper end of the right fibula. These are nearly equal in size to the corresponding parts of the skeleton of the *Dinornis*, as the following dimensions demonstrate:—

	<i>Aepyornis.</i>		<i>Dinornis giganteus.</i>	<i>Casuarus.</i>	
	in.	lin.	in.	lin.	in.
Extreme breadth across the trochlear condyles . . .	5	0	5	6	2 3
Transverse diameter of shaft 6 in. above lower end† .	2	9	2	3	0 11 $\frac{1}{4}$
Antero-posterior diameter of shaft 6 inches above lower end	1	3	1	5	0 7

In neither *Dinornis* nor *Aepyornis* is the metatarsus perforated, as in *Casuarus* and many other birds, above the interspace between the two outer condyles: that interspace is simply deeper, or curved higher in both. The outer trochlea, which is entire in both portions of the metatarsi in *Aepyornis*, is, in a marked degree, smaller than

* Comptes Rendus de l'Académie des Sciences, Jan. 27, 1851.

† One-third the length of the entire bone in *Dinornis giganteus*.

in *Dinornis*, as is also the inner trochlea, as far as one may judge from the posterior part which is preserved. The interspaces of the trochleæ are wider posteriorly in *Æpyornis*, and the outer one is more angular at its upper end. The middle portion of the posterior surface of the lower third of the shaft of the metatars in *Æpyornis* is more produced than in *Dinornis*, and a ridge is continued from it to each lateral trochlea, dividing the back part of the shaft above them into three surfaces; whereas the corresponding surface in *Dinornis* is simply flat from side to side. Above this part in *Æpyornis* the posterior surface on each side of the middle prominence is concave and meets the anterior surface at a ridge, which is narrowest at the outer border of the bone. In *Dinornis* both borders of the lower third of the shaft are thick and rounded.

The *Æpyornis* does not show any trace of the rough tract for attachment of a back toe, as in the *Palapteryx robustus*; in this respect it resembles the *Dinornis*.

At 6 inches from the lower end, the shaft begins to be concave along the middle of the fore part, the concavity deepening as it ascends; whereas in *Dinornis* the anterior median concavity of the shaft does not begin to appear until above the upper half of the bone. In this character the *Æpyornis* resembles the Cassowary; but it differs from the Cassowary in the much narrower or sharper lateral margins of the shaft of the metatarsus. Like the Cassowary, however, the breadth of the shaft is greater in proportion to that of the trochleæ than in the *Dinornis* or *Palapteryx*.

It would be hazardous to conclude as to the length of the entire metatars from the breadth of the distal end; for this is equal in *Dinornis giganteus* and *Palapteryx robustus*, whilst the length of the metatars is 1 foot 6 in. in the one and 1 foot 4 in. in the other. I think it more probable, however, that *Æpyornis* had a shorter than that it had a longer metatars than the *Dinornis giganteus*.

That its leg-bones were smaller is significantly indicated by the difference of size in the fibulæ.

	<i>Dinornis</i> .		<i>Æpyornis</i> .	
	in.	lin.	in.	lin.
The longest diameter of the upper end . .	2	11	2	9
The shortest diameter of the upper end . .	1	4	1	0

This bone in *Æpyornis* shows a flat, full, oval articular facet on its tibial side, of which there is no trace in *Dinornis*.

Upon the whole, therefore, Prof. Owen concluded that the *Æpyornis maximus* did not surpass in height or size the *Dinornis giganteus*, and that it was more probably a somewhat smaller bird.

From the obvious differences which M. Geoffroy found on comparing these fragments with the casts of the metatarsus of the *Dinornis giganteus*, he has inferred with much probability not only its specific but generic distribution, and has proposed for it the name of *Æpyornis maximus**. This distinction is illustrated not only by the metatarsal bones, but by the eggs themselves. Mr. Walter

* From αἰπὸς alta, ὄρνις avis. The trivial epithet is hazardous, to say the least, with the results of the comparison with the above recorded.

Mantell, of Wellington, New Zealand, has recorded his observation of an egg of a *Dinornis* found in the volcanic sand, of the magnitude of which he endeavours to give an idea by stating that his hat would have been but large enough to have served as an egg-cup for it.

The fragments of the egg of *Dinornis* or *Palapteryx*—of what species, of course, cannot be determined—show, after arriving approximately at their size by the curve of the fragments, that the shell was not only absolutely thinner, but relatively much thinner than in the Ostrich, and *à fortiori* than in the *Apyornis*. The air-pores, also, have a different form, being linear, not rounded; and the external surface is smoother.

In the smoothness and thinness of the shell, the egg of the *Dinornis* resembles that of the *Apteryx*: in the thickness of the shell and the comparative roughness of its exterior, the egg of the *Apyornis* more resembles that of the Ostrich and Cassowary.

Such colour—a dull greyish yellow, as the *originals* of the eggs of the *Apyornis* now at Paris show—may well have been derived from the recent alluvial soil in which it is stated that they were discovered: the darker stain on one part of the circumference of the larger egg seems to have been due to some accidental circumstance. Most probably they were originally white, like the eggs of the Ostrich, and like the fragments of the eggs of the *Dinornis*: whether an original green tint, like that of the egg of the Emu and Cassowary, would be wholly discharged by long continuance in the soil, may be a question.

It is most probable that the entire eggs of the *Apyornis* were excluded in the usual fertile state, but had suffered such want or interruption of the heat requisite for their incubation as to have become added.

How hazardous it is to judge of the size of a bird by that of its egg would appear, Prof. Owen observed, by the remarks which he should next proceed to offer on the eggs of the *Apteryx*. Of these the Professor exhibited one entire specimen, and a nearly fully incubated chick from a second egg, both of which had been most liberally transmitted to him by the Rev. Wm. Cotton, M.A., from the North Island of New Zealand.

Had it not been for the demonstration afforded by the chick itself, it might well have been doubted whether so small a bird could have excluded so large an egg. The following are the dimensions of the egg (Aves, Pl. XLVI.) :—

	Egg of <i>Apteryx</i> .		
	ft.	in.	lin.
Greatest longitudinal circumference	1	0	9
Greatest transverse circumference	0	10	0
Length	0	4	10
Breadth	0	3	2

The egg presents the usual long oval form, the colour a dull dirty greyish white; but this is partly due to grease stains from the decomposition of an incompletely hatched chick, with its yolk, within.

Viewed under a moderately magnifying power the surface presents a very fine fibrous, or spicular character; the raised lines, like spiculæ,

crossing in opposite directions, with air-pores scattered here and there and barely perceptible to the naked eye. The shell is not more than $\frac{1}{4}$ th of a line in thickness. Supposing, as is most probable, from the size of the bones of the *Apyornis*, that it did not exceed the *Dinornis giganteus* in size, the egg of the *Apyornis* is smaller in proportion to the bird itself than the egg of the *Apteryx* is in proportion to that bird.

The embryo *Apteryx*, which had been removed from its shell, had nearly reached the term of its incubation, the yolk-bag being reduced to a hernia-like appendage of an inch in length and half an inch in breadth, protruding about two lines in advance of the cloma, and covered by a continuation of the ordinary integument of the abdomen : the free end of the hernia was open, and exposed the ruptured ends of the allantoic vessels.

The whole body was clothed by down-fascicles, presenting the appearance of moderately thick cylindrical hairs, $1\frac{1}{4}$ inch in length, with a smooth, unbroken exterior, gradually tapering to a fine point. This smooth surface is due to an extremely delicate capsule, which when torn open exposes the down-tuft, consisting of a central stem with slender smooth barbs from 3 to 5 lines in length, diverging loosely from each side of the stem.

	in.	lin.
Length of the body from the base of the beak to the tail	4	0
Length of the beak	1	7
Length of the leg from the knee-joint	4	3
Length of the freely projecting part of the fore-limb from the elbow-joint	0	6

From these dimensions it will be seen that, with the characteristic large size of the unhatched young, in the genus *Apteryx*, the chief peculiarities of the remarkable external form of the bird had been acquired. The feet were very completely formed with well-developed claws, the small back claw presenting its characteristic proportions, and the integument of the naked part of the foot its well-marked dentations. The little wing-rudiments had their terminal hook. The tail presented the form of a short bifid prominence. The beak being comparatively soft, had become distorted and bent in the bottle of spirits in which the specimen was transmitted to the Professor, but it showed its characteristic shape, the terminal nostrils, and the slight terminal expansion, which forms the end of the crutch in the mature bird. The eyelids, with their cilia, and the orifice of the ear opening obliquely upwards, were rather larger in proportion than in the adult, according to the usual law of the precocious development of those organs of sense ; and the same remark applies to the entire cranium. The neck is relatively shorter and thicker.

The young bird must be excluded unusually well developed, with a complete clothing very like that of the parent, and capable of using its limbs and beak for its own safety and support.

February 10, 1852.

William Yarrell, Esq., in the Chair.

The Chairman exhibited a specimen of the *Echiodon Drummondii* of Mr. Thompson of Belfast, a very rare species of fish, of which only one example has been previously known. Dr. Drummond obtained the first specimen on the beach at Carnclough, near Glenarm in the county of Antrim, in June 1836, cast ashore probably by the tide of the preceding night, after a strong easterly wind. The species was considered new to ichthyology, and was first described and figured in the Transactions of this Society by Mr. Thompson, vol. ii. p. 207. pl. 38. Nothing that has transpired since the publication of Mr. Thompson's paper has induced a belief that this species had been previously known.

The specimen now exhibited was most liberally sent to Mr. Yarrell by Mrs. Blackburn of Valencia, in the county of Kerry, who was perfectly aware of the characters, the rarity, and the value of the fish. It was found by her daughter Helen on the shore of the harbour of Valencia, after a violent storm from the west, which occurred there on the 23rd of January last.

This example is smaller than the one noticed by Mr. Thompson, measuring only 8 inches in length, but quite perfect. Mr. Thompson's example measured 12 inches (Brit. Fishes, vol. ii. p. 417).

The following papers were then read :—

1. ON CYSTOSOMA SAUNDERSII, OF CURTIS AND WESTWOOD.

By A. W. SCOTT, M.A.

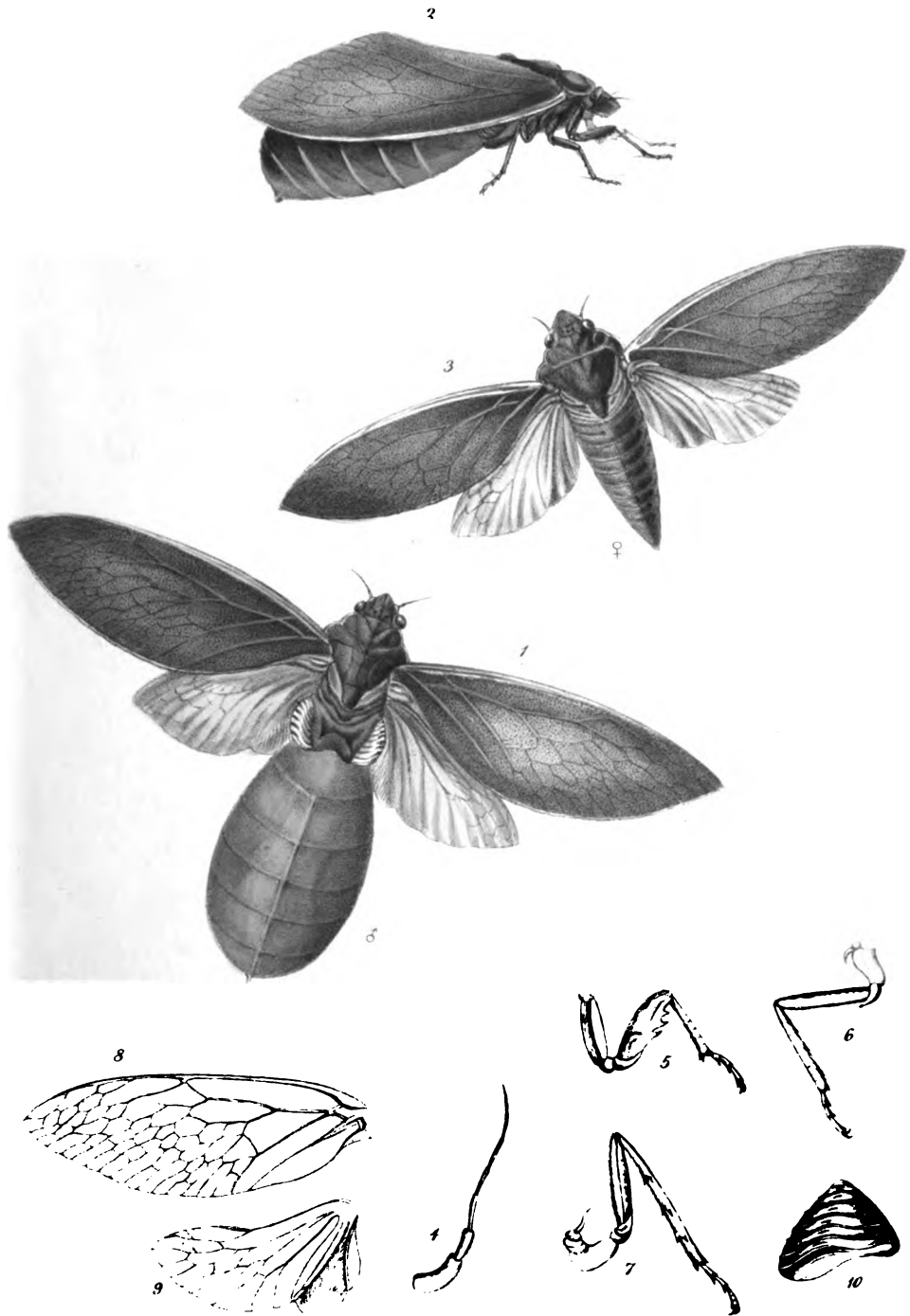
(Annulosa, Pl. XXI.)

Head small; sides of the thorax running in a straight line from the head to an acute angle behind; abdomen of the male deeply constricted immediately behind first segment; second joint of the antennæ distinct from the third, and not forming with it the tapering setæ which terminates them; upper wings destitute of a nervure running parallel to their inner margin.

The male (figs. 1 and 2) measures, in expanse of wings, nearly $4\frac{1}{2}$ inches; the female (fig. 3) $3\frac{1}{2}$ inches.

The antennæ (fig. 4, magnified) in both sexes are very short, 7-jointed, the two basal joints strong and thick, the remainder much finer and gradually terminating in a point.

The legs, anterior pair (fig. 5), with two minute spurs at the apex of tibia; the femora are robust, with their lower edges serrated; the second (fig. 6) and posterior (fig. 7) pairs longer than the anterior, with minute spurs on the ends of the tibiæ and setæ, placed in pairs and evenly distributed along the inner edge; the femora of these are slender and not serrated. The tarsi of all the legs 3-jointed, and terminated by two strongish claws, and fringed underneath by setæ.



Cystosema. Saundersi

From the base of each coxa of the second and posterior pairs there proceeds a large flexible spine.

The upper wings (fig. 8) are coriaceous, lanceolate and sharply pointed, with the cells of inner side open, and not shut in by a long marginal nervure as in the true *Cicadæ*. The under wings (fig. 9) are small, and furnished with very weak nervures.

The colour of the whole upper surface of both sexes is of a pale delicate green, with the exception of the posterior wings, which are transparent, possessing, however, a slight greenish tinge. The costæ of the fore-wings are white, with a pinkish hue running along the centre. The under portion of the base of the upper wing inclines to yellow, which colour extends round the thorax. The antennæ are black, and the eyes a bright, light reddish colour. In the preserved specimens, the beautiful delicate green, which constitutes the general colour, becomes duller and darker, and frequently assumes a hue of sickly yellow.

The drums of the male (fig. 10) are rounded, and marked by seven transverse furrows, slightly tinged with brown, in the middle, and different from those of the true *Cicadæ* in being more conspicuous on a dorsal view of the insect. Besides, the abdomen is deeply constricted immediately behind them, so that the first segment appears as it were to form part of the metathorax, and the abdomen seems merely composed of the seven last segments, which are here exceedingly inflated, as in the orthopterous genus *Pneumora*.

The abdomen of the female is of a size and form more corresponding to that of the female *Cicadæ*, but it is of a more cylindrical form and less angular at the sides. The dilated sides of the metasternum, which form the two plates covering the under sides of the drums in the male, are here comparatively small.

These insects are extremely numerous on Ash Island, principally inhabiting an orange grove of about 1200 trees, and we scarcely ever remember seeing one beyond a few rods of the limits of this garden, nor have we ever heard of or discovered a single specimen elsewhere, with the exception of the few brought by Sir Thomas Mitchell from the interior.

During the short twilight of this country, the male commences and ends his song, which resembles a loud deep guttural, R, continued incessantly, and with vibrations. So loud indeed is this sound, that when near to several insects it becomes even painful to the ear. It is, moreover, very unlike the shriller and harsher notes uttered by the common *Cicada*.

In this brief period after sunset the males and females occasionally fly from tree to tree, their flight being slow and steady, particularly that of the former. The only other time in which these insects are heard is immediately, in hot and sultry weather, before a thunder-storm, and then only at broken intervals. This habit was particularly noticed on our placing the males on a bunch of flowers in the drawing-room, where every evening they regaled us with their short-lived song, and at other periods occasionally predicted the coming storm.

The larvæ live underground upon the roots of plants, and in their

habits and transformations closely approximate to those of the common *Cicada*.

The perfect insects appear early in September, and are to be found until about February. They are extremely easily captured, the females being taken when in flight by a common butterfly net, and the males by going to the spot from where their voices proceed, and suddenly shaking the bough, which causes them to drop to the ground, when they may be picked up.

The male has been indifferently figured under the name of *Cystosoma Saundersii*, in the 'Arcana Entomologica,' in which Mr. Westwood mentions its affinity to *Hemidictya*, and gives good dissections. His description, however, is not correct, when he characterizes the insect as "pallide lutea," whereas the species is "læte viridis." The female, we believe, is not known in England.

Ash Island, Hunter River, New South Wales,
Nov. 6, 1851.

2. DESCRIPTION OF A NEW SPECIES OF *ANOMALURUS*, FROM FERNANDO PO. BY LOUIS FRASER, H.B.M. VICE-CONSUL FOR THE KINGDOM OF DAHOMEY, NATURALIST TO THE NIGER EXPEDITION IN 1841-42, LATE CURATOR TO THE ZOOLOGICAL SOCIETY OF LONDON, AND LATE TEMPORARY CONSERVATOR OF THE KNOWSLEY COLLECTION, ETC.

(Mammalia, Pl. XXXII.)

The Proceedings of this Society contain the description of a very interesting new form of Rodents, discovered by myself at Fernando Po, and to which the name *Anomalurus Fraseri* was given by Mr. Waterhouse. A second species of the genus has subsequently been found in Ashantee, by an enterprising collector sent out by the Directors of the Leyden Museum, and has been named after its discoverer, by M. Temminck, *Anomalurus Pelii*. I have now to submit to your notice a third species of the genus, which I propose to name after my friend and coadjutor, John Beecroft, Esq., H.M. Consul for the Bights of Benin and Biafra, also Spanish Governor of the island of Fernando Po, as a just tribute to one who has devoted upwards of twenty-three years to the cause of Western Africa and its inhabitants, and whose knowledge of both is unequalled. This extraordinary gentleman has entered all (or nearly all) the rivers on this coast, so fatal to Europeans, and after six weeks' search amongst the swamps and creeks, has discovered the junction of the Benin and Niger: this latter river he has navigated three or four times as high up as Rabba. He also ascended Clarence Peak.

The principal peculiarities of the three species of *Anomalurus* are as follows:—

ANOMALURUS FRASERI, Waterh.

General hue of the upper parts brown; the flank-membranes dusky or black; under parts dirty white, slightly washed with buff-yellow; a considerable area around the base of the ears black, as well as the

ong hairs on the basal part of those organs; cheeks deep brown; throat grey; feet and tail dusky.

Hab. Fernando Po.

ANOMALURUS BEECROFTI, Fraser (Mammalia, Pl. XXXII.).

Upper parts, including the greater portion of the flank-membranes, yellowish grey, slightly inclining to rufous on the mesial line of the back, especially on the fore part; under parts of a bright rust colour; cheeks and throat grey, excepting that the latter has a narrow rust-coloured mark in the middle; a white spot on the crown of the head (probably not constant), and a short white band on either side of the neck running on the shoulders; a dusky patch on the flank-membrane above, commencing on the margin of the membrane near the anterior part, and extending backwards and inwards rather less than half way along the flanks; tail dusky brown.

Hab. Fernando Po.

This species is rather larger than the *An. Fraseri*, and differs, moreover, in the upper parts of the body being yellow-grey, instead of brown; in having the greater portion of the flank-membranes as well as the feet grey, instead of dusky; in wanting the conspicuous black area around the base of the ears—the part in question being of the same general grey colour in *An. Beecrofti* as other parts; in having the cheeks hoary grey, instead of deep brown; and in having the under parts of a bright rusty red. There are differences likewise to be observed in the scales on the under side of the tail; they cover less space in the longitudinal direction, are broader, and have the projecting angles less prominent.

	in. lin.
Length from tip of nose to root of tail	15 0
— of tail	9 0
— of the scaly portion beneath	3 3
— from nose to ear	2 3
— of ear	1 3
— of fore foot and claws	1 11
— of hind foot and claws	2 9

ANOMALURUS PELII, Temminck.

Larger than either of the foregoing. Black above; dirty white below; throat dusky; chin, upper surface of the nose, the region of the muffle (or naked portion of the nose), the long and soft hairs on the outer surface of the ears at the base, and the tail, white; the flank-membrane is broadly margined with white, and the hairs on the feet are for the most part white, but with an admixture of black or dusky; the long hairs springing from the base of the nails of the hinder feet are black.

Hab. Ashantee.

February 10, 1852.

W. Yarrell, Esq., in the Chair.

The following papers were read :—

1. MONOGRAPH OF THE FAMILY BRANCHIPODIDÆ, A FAMILY OF CRUSTACEANS BELONGING TO THE DIVISION ENTOMOSTRACA, WITH A DESCRIPTION OF A NEW GENUS AND SPECIES OF THE FAMILY, AND TWO NEW SPECIES BELONGING TO THE FAMILY LIMNADIADÆ. BY W. BAIRD, M.D., F.L.S. &c.

(Annulosa, Pl. XXII. XXIII.)

Next to the *Apodidæ*, the largest species of *Entomostraca* belong to the family *Branchipodidæ*. This family contains perhaps the most beautiful animals of the division, elegant in form and graceful in movement. The species are, geographically, widely extended, but those as yet described are few in number.

The Family may be thus characterized.

Order PHYLLOPODA.

Family BRANCHIPODIDÆ.

Pedes branchiales, paribus undecim ad novemdecim. Antennæ dissimiles, paribus duobus; par inferior in mare prehensilis. Oculi duo, pedunculati. Corpus cylindricum, nudum, clypeo nullo obtectum.

The feet are all branchial, being formed entirely for breathing with, and consist of 11 pairs, each pair gradually enlarging in size as they descend. They are in constant motion, and when so, present a very beautiful wavy appearance. Like the *Apodidæ* the animals of this family swim upon their backs. The body consists of a considerable number of segments, and is quite naked, having neither a shield-shaped carapace like the *Apodidæ*, nor a bivalve-shell-shaped carapace like the other families of the Order *Phyllopoda*. The antennæ are dissimilar in appearance in the male and female. The superior pair in both sexes are slender and filiform, but the inferior pair are much larger in the male than in the female, and serve the purpose of prehensile organs. The eyes are two in number, compound, oval-shaped, and are placed upon considerable-sized peduncles. Like the *Apodidæ*, the young *Branchipodidæ* have only one eye, which disappears in the process of moulting, but leaves a mark behind which remains visible in the adult.

The species included in this family are referable to five genera.

Genus BRANCHIPUS, Schæffer.

Corpus molle, cylindricum, segmentum caudale pinnis duabus ciliatis instructum. Pedes undecim. Antennæ inferiores maris magnæ, bi-articulatæ, cornibus similes, appendicibus duabus filiformibus, antenniformibus, armatæ.

The body is soft, cylindrical in shape, and is composed of twenty-two segments. The head consists of two and the thorax of eleven, each of which gives attachment to a pair of branchial feet. The abdomen consists of nine, the caudal segment dividing into two broad flat appendages of some length, and plumose on their edges. The inferior antennæ, or "cephalic horns," in the male are large organs; they are composed of two articulations, which being cylindrical and curved at the apex give an appearance of a pair of horns, and they have springing from near their base a filiform appendage closely resembling in appearance the superior antennæ. The structure of these inferior antennæ, or cephalic horns as they are generally termed, and the filiform appendage at their base, which are frequently described as an additional pair of antennæ, sufficiently distinguish the genus.

Only two species of *Branchipus* have as yet been described.

1. *BRANCHIPUS PISCIFORMIS*, Schæffer. *Antennis inferioribus maris magnis, compressis, apice bifurcatis; appendicibus antenniformibus filiformibus prælongis; fronte prolongato, bisulco.*

Long. $\frac{1}{4}$ poll.

Syn. *Apus pisciformis*, Schæffer, Der Fisch-form. Kiefenfuss, etc. t. 5. f. 1-11 (1752).

Cancer stagnalis, Linnæus, Syst. Nat. edit. 10. 634 (1758); Faun. Suec. ed. 2. 497. No. 2043 (1761); Fabricius, Ent. Syst. ii. 518. No. 11; Mantiss. i. 335. No. 10; Müller, Zool. Dan. Prodrom. 2351; O. Fabricius, Faun. Grœnland. 247. No. 224.

Branchipus pisciformis, Schæffer, Element. Entomol. t. 29. f. 6, 7 (1766).

Gammarus stagnalis, Fabricius, Syst. Entom. 419. No. 5.

Cancer (Gammarellus) stagnalis, Herbst, Krabben und Krebse, ii. 121. No. 66. t. 35. f. 8-10 (1796).

Branchiopoda stagnalis, Lamarck, Syst. An. s. Vert. 161; Latreille, Hist. Nat. Crust. iv. 319. t. 36, 37; Gen. Crust. i. 22; Bosc, Man. d'Hist. Nat. Crust. ii. 234.

Branchipus stagnalis, Latreille, Enc. Méth. t. 336. f. 14-16; Règne Anim. iv. 174; Leach, Dict. Sc. Nat. xiv. 542; Edin. Encyc. vii. 384; Desmarest, Cons. gen. Crust. 389; Lamarck, Hist. An. s. Vert. v. 133; M. Edwards, Hist. Nat. Crust. iii. 367; Règn. An. ed. Crochart, t. 74. f. 2.

Branchipus Schæfferi, Fischer de Waldheim, Bull. Soc. Imp. Moscou, vii. (1834); Thompson, Zool. Research. fasc. v. t. 3. f. 1-3 (1834).

Branchipus melanurus? Koch, Deutsch. Crust. H. 35. t. 2.

Ino stagnalis? Oken, Lehrb. der Naturg. iii. 399.

Larva aquatica, Linn. Faun. Suec. ed. 1. 358. No. 1357.

Hab. In vicinitate urbis Ratisbonæ; Schæffer. In vicinitate urbis Paris; M. Edwards.

This species according to Schæffer's description is half an inch long, about the thickness of a straw, and semipellucid. The male is generally of a pale red or flesh colour, though sometimes varying between vermilion and orange. The female is of a dull green, with the

ovaries generally of a bright blue. The inferior antennæ of the male are large organs, somewhat flattened in shape, broad at the base, toothed at about two-thirds of their length on the external edge, and becoming narrower near the extremity, which presents an appearance as if somewhat bifurcated. Those of the female are much shorter, cylindrical, and pointed at the extremity. The two antenniform appendages arising from near the base of these organs in the male are of considerable length, longer than the antennæ themselves, and filiform. The front of the head is prolonged into a prominence which is cleft down the centre and forked. The feet are long, composed of three joints, all of which are nearly of equal size, and have their edges beset with numerous short hairs or setæ, which when magnified are finely plumose. The caudal fins are of considerable size, flat and plumose. The male organs are slender and rather long.

2. *BRANCHIPUS SPINOSUS*, M. Edwards. *Antennis inferioribus maris magnis, cylindricis, apice acuminatis; appendicibus antenniformibus curtis, crassis; abdominis segmentis infra spiniferis.*

Long. 1 poll. 2 lin.

Branchipus spinosus, M. Edwards, Hist. Nat. Crust. iii. 367.

Hab. In lacu salino "Hadjibé," in vicinitate urbis Odessæ; *M. Nordmann.*

This species, which was discovered by Professor Nordmann in a salt lake near Odessa, is upwards of an inch in length. The inferior antennæ of the male are large, cylindrical, the terminal articulation being sharp at the point. They possess no tooth or process, and the antenniform appendages are very short compared with those of the preceding species, and of a considerable degree of thickness. The front of the head has no prolongation. The feet are short. The segments of the abdomen are armed underneath with sharp spines, and the caudal fins are short and plumose. The male organs are short and obtuse.

Genus STREPTOCEPHALUS.

Corpus cylindricum, segmentum caudale pinnis duabus ciliatis instructum; pedes undecim; antennæ inferiores maris triarticulatæ, valde tortuosæ, ad apicem in ramos graciles divisæ, appendicibus antenniformibus armatæ.

In the structure of the body, abdomen, and feet, this genus resembles entirely the preceding. The inferior antennæ, or cephalic horns, in the male, however, are very different in structure; they are longer in proportion than the corresponding organs in the *Branchipus*, consist of three articulations, and are singularly twisted, and bent as it were into elbows. The terminal joint divides at the apex into two branches. They are inhabitants of fresh water. Only two species have as yet been described, and I now add a third to the number.

1. *STREPTOCEPHALUS TORVICORNIS*, Waga. *Antennis inferioribus maris validis, ramis terminalibus elongatis, serratis, interno*

longiore, processu triangulari brevi armato, appendicibus antenniformibus elongatis filiformibus; fronte prolongato, acuminato; ovario externo conico.

Long. maris 1 poll., fœminæ circa 14 lin.

Branchipus torvicornis, Waga, Ann. Soc. Ent. de France, xi. 261.

t. 11. f. 1-4.

Hab. In vicinitate urbis "Warsaw;" *Krynicky*.

This species, which was discovered by M. Krynicky in a muddy stagnant piece of water near the town of Warsaw, is upwards of an inch in length, the female being longer than the male. The inferior antennæ or cephalic horns of the male are very large, when extended equalling in length the whole body. The basal joint is strong, and broad at its junction with the head; the second is short, and the third is divided at the apex into two branches, which are long, slender and serrated on their inner edges, the internal one being the longer, bent into the form of a hook, and having on its external edge a process of a triangular form and acuminate at the point. The first and second joints are armed with several minute teeth, and the antenniform appendages are straight, slender, but somewhat stouter than the superior antennæ. The front of the head is prolonged into a prominence which is pointed. The inferior antennæ in the female are flat, and obtusely rounded at the extremity. The ovarian bag is conical in shape and of a blue colour. The caudal fins are of considerable size and plumose on their edges.

2. *STREPTOCEPHALUS CAFER*, Lovén. *Antennis inferioribus maris longis, articulo basali intus appendice lacinulata brevi prædito, ramo terminali interno longo, flexuoso, inermi; fronte prolongato, in rostrum lunatum producto; ovario externo caligæformi.*

Long. 15 millim.

Branchipus cafer, Lovén, Kongl. Wet. Akad. Handl. 1845, 433.

t. 5. f. 1-20.

Hab. In paludibus terræ Cafrorum Natalensium; *Wahlberg*.

This species was discovered by M. Wahlberg in some pools of fresh water in Port Natal, and is about 15 millimetres in length. The inferior antennæ or cephalic horns in the male are long stout organs and flexuose in shape. The basal joint is rather short, rounded, and is furnished at its base on the internal edge with a short appendage of a lanceolate form and toothed on its edge externally. The third joint divides at the apex into two branches, the internal one being long, slender and flexuose, the external being club-shaped and forked at the extremity, dividing into two other slender branches of unequal length. The antenniform appendages are filiform and flexuose. The front of the head is prolonged into a narrow deflected beak, which is forked at its extremity. The male organs are long and slender; they are composed of four articulations, the last of which is much the longest, is curved, and armed on each side with a numerous row of teeth and spines.

In the female the cephalic horns are broad, thick, and furnished

with a sharp hooked point at the extremities. The caudal fins are of considerable size and finely plumose. The oviferous sac is long and narrow, and resembles very much in shape a long stocking or boot. The ova are of a rosy colour.

3. *STREPTOCEPHALUS SIMILIS*, Baird (Tab. XXII. fig. 3, 4). *Antennis inferioribus maris longis, cylindricis, appendice lunulata destitutis, ramis terminalibus præcedenti similibus, appendicibus antenniformibus filiformibus elongatis; fronte prolongato, in rostrum bilobatum producto; ovario externo conico.*

Long. maris 8 lin., fœm. 6 lin.

Hab. In insula "St. Domingo," in India Occidentali. Collegit M. Sallé. Mus. Brit.

This species, which was found by M. Sallé in the island of St. Domingo in the West Indies, is of a slender and cylindrical form. The male is about $\frac{4}{5}$ ths of an inch in length, and the female half an inch. The inferior antennæ or cephalic horns in the male are large and tortuous; they are composed of three joints; the first or basal joint is the largest, is cylindrical, and extends for some distance straight forwards; the second, smaller than the basal, is also cylindrical, curves slightly at first, then bends suddenly backwards upon itself; the third or terminal joint bends as suddenly forwards and terminates in a club-shaped extremity, which divides into two branches, one longer than the other, terminating in a long filiform process; the other flatter, shorter, and dividing into two shorter filiform processes of unequal length. The antenniform appendage is long and cylindrical, rather stout, and springs from close to the extremity of basal joint. The basal joint is destitute of the lanceolate, toothed appendage on internal edge, which we see in the preceding species. The superior antennæ are long and slender, and consist of two joints, the basal one much shorter than the second. The male organs are rather long, cylindrical, and of a horny texture. The front of the head is prolonged into a beak, which is flat, rather broad and slightly lobed at the extremity. Feet short. Abdomen slender. Caudal appendages of moderate length, and beset on each side with numerous short and plumose setæ.

The cephalic horns in the female are short, thick, and terminate in a short spine at the extremity. The ovarian bag is conical, acute, and the ova are of an ochreous colour.

The chief differences between this species and *S. cafer* consist, in the male, in the shape of the front of the head, the organs of generation, and in the inferior antennæ having no lamina with teeth on the basal joint; in the female, in the shape of the external ovary.

Genus CHIROCEPHALUS, Prevost.

Corpus molle, cylindricum; segmentum caudale pinnis duabus ciliatis instructum; pedes undecim; antennæ inferiores maris validæ, biarticulatæ, appendicibus digitiformibus flabelliformibusque armatæ.

This genus closely resembles the two preceding in the shape and

form of the body, having the same number of articulations, possessing the same number of feet, and having similar caudal fins. It is in the structure of the inferior antennæ or cephalic horns in the male, that the important difference between the two genera exists. These antennæ are very large, and are composed of two joints. At the base of the first joint a complicated apparatus arises, which when unfolded presents a very curious appearance. This consists of a long, flat, curved, very flexible body, somewhat tapering and toothed on its edges, and composed of numerous short articulations, which the animal can fold up upon itself like a ribbon. Springing from its external edge near the base are four rather long and flexible appendages strongly toothed on their internal edge, somewhat resembling long fingers, and in addition to these a large membranous triangular-shaped body, toothed on its edges all round, which when extended nearly covers the finger-like bodies, and can be folded and unfolded like a fan. When the animal is at rest these organs are folded up underneath the head in the same manner as a butterfly folds its proboscis, but when in pursuit of the female they become extended at full length and present a very beautiful appearance.

Five species of this genus have now been described.

1. **CHIROCEPHALUS DIAPHANUS**, Prevost. *Antennis inferioribus maris validis, cylindricis, apice acuminatis, processu dentato ad basin articuli secundi armatis; fronte rotundato.*

Long. maris 14 lin., fœminæ 1 poll.

Pro Synonymis vide "Baird's Nat. Hist. of the British Entomotraca, Ray Society, 1850."

Hab. In Anglia, Gallia, prope Genevam, &c. &c.

This species, which occurs in many places in England, as well as in France, Switzerland, &c., is very elegant in form, and (the male more especially) very beautiful in colour. It is upwards of an inch in length, slender, of a cylindrical form, and nearly transparent. In the male the inferior antennæ or cephalic horns are of a beautiful translucent bluish green colour, tipped at the extremity with a fine red hue. The caudal fins are of a bright red. The female has a strip of blue along the whole length of the back, and the ovarian bag when full of ova is conical in shape and of a reddish brown. The inferior antennæ of the male are very strong organs, divided into two joints; the basal joint is thick and fleshy, and the terminal joint is cylindrical and curved in the form of a horn, having at the base where it joins the first joint a flat plate attached to it, beset with several stout teeth. The apparatus which we find at the base of the first joint, consisting of the long, flat, somewhat tapering body with its digitiform and fan-shaped appendages, is of a very delicate transparent bluish green colour. The antennæ of the female are short, stout, pointed at the extremity, flexible, and slightly curved downwards.

2. **CHIROCEPHALUS LACUNÆ**, Guérin. *Antennis inferioribus maris validis, valde arcuatis, articulo basali magno, dentato, terminali cylindrico, ad apicem sinuato.*

Long. maris et foeminae 12-15 millim.

Branchipus lacunæ, Guérin, Iconog. Règn. Anim. Crustacés, 39. t. 33. f. 4, 4 a.

Hab. In stagnis prope "Fontainebleau;" *M. Guérin.*

This species, which is briefly described by M. Guérin in the 'Iconographie du Règne Animal,' is found in little pools of water near Fontainebleau. It is transparent, but is smaller than the preceding species, and is distinguished from it by the shape of the inferior antennæ or cephalic horns in the male. These organs are of two joints; the basal one large, and armed on its internal edge with several stout teeth or lobes; the second much smaller, cylindrical, bent suddenly back upon the first, and sinuated, or as it were slightly toothed at the apex. The long ribbon-like appendage which springs from the base of the first joint appears to have only two very short processes attached to it, instead of the four long finger-like bodies, and the fan-shaped body is not represented at all; but this part of the head is not sufficiently described by M. Guérin to enable me to satisfactorily ascertain its exact structure.

3. *CHIROCEPHALUS CLAVIGER*, Fischer. *Antennis inferioribus maris validis, articulo basali magno, terminali parvo, ad basin dentato, ad apicem clavato; antennis superioribus quadri-articulatis; fronte rotundato.*

Long. 8-10 lin.

Branchipus claviger, Seb. Fischer, Middendorff's Sibirische Reise, ii. Wirbellose, 149. t. 7. f. 1-11 (1851).

Hab. In fluvio Taimyr, in Siberia; *Middendorff.*

This species, which is about 8 or 10 lines long, was discovered by M. Middendorff in a pool of water by the river Taimyr in Siberia. The inferior antennæ of the male are strong organs; the basal joint being stout and fleshy and the terminal narrow, provided with about a dozen small teeth at its base, and ending in a club-shaped extremity. The digitiform appendages are more numerous apparently than in *C. diaphanus*. They arise from the extremity of the long riband-like appendage, instead of from its base, and each of them has several teeth on the sides and apex. In the female these antennæ are small, narrow and sharp-pointed. The superior antennæ are divided into four articulations.

4. *CHIROCEPHALUS BIROSTRATUS*, Fischer. *Antennis inferioribus maris validis, articulo basali magno, terminali mediocri, prope basin processu elongato armato, ad apicem uncinato.*

Long. 10-12 lin.

Branchipus birostratus, Seb. Fischer, Middendorff's Sibirische Reise, ii. t. 7. f. 12-16 (1851).

Hab. Prope urbem "Charkow" in Russia; *Fischer.*

This species is about 10 or 12 lines long, and was found by Fischer in the neighbourhood of the town of Charkow, in Russia. The inferior antennæ of the male are strong organs, the basal joint stout and fleshy, the terminal of moderate size, having, springing

from near its base, a somewhat elongated process armed with sharp teeth at its extremity, and ending in a sort of hooked point. The riband-like process appears similar to that of *C. diaphanus*.

5. *CHIROCEPHALUS MIDDENDORFFIANUS*, Fischer. *Antennis inferioribus maris validis, articulo basali magno, longissimo, numerose dentato, terminali cylindrico, acuto; antennis superioribus quadri-articulatis; fronte quadrangulari.*

Long. 7-9 lin.

Branchipus Middendorffianus, Seb. Fischer, Middendorff's Sibirische Reise, ii. 153. t. 7. f. 17-23 (1851).

Hab. In fluviis "Taimyr et Boganida" in Siberia; prope "Tri-Ostrowa" in Lapponia; *Middendorff*.

This species, which is only from 7 to 9 lines in length, was found by Middendorff in pools on the banks of the rivers Taimyr and Boganida in Siberia, and in Lapland near Tri-Ostrowa. The inferior antennæ in the male are stout organs, the basal joint being very long and fleshy and armed along the inner edge with a long row of many teeth, the terminal being cylindrical in shape and pointed at the extremity. The superior antennæ are four-jointed, and the front of the head is of a quadrangular shape. The ovarian sac in the female is long and rather slender, and appears to be notched at the base.

Genus ARTEMIA, Leach.

Corpus molle, gracile; segmentum caudale pinnis nullis instructum; pedes undecim; antennæ inferiores maris magnæ, biarticulatæ, compressæ, appendicibus nullis armatæ.

Syn. *Cancer*, Linnæus.—*Gammarus*, Fabricius.—*Eulimene*, Latreille et auctorum.—*Artemia*, Leach et auctorum.—*Branchipus*, Latreille, Fischer, &c.—*Artemisus*, Lamarck.—*Artemis*, Thompson.

The body in this genus consists of the same number of segments as in the three preceding, is soft and without covering, but is more slender in shape, and has the caudal segment simply bilobed at the extremity, instead of being armed with two large plumose fins. The inferior antennæ in the male are large, flat-shaped, broad, and divided into two articulations. The basal joint has neither the antenniform appendage of *Branchipus* and *Streptocephalus*, nor the complicated digitiform and fan-shaped apparatus of *Chirocephalus*. They inhabit salt water, frequently even in water which is very highly charged with salt. They swim upon their backs.

The genus *Eulimene* was founded by Latreille in 1817, in Cuv. Règn. An. 1st edit. iii. 68; that of *Artemia* by Leach in 1819, in the Dict. Sc. Nat. xiv. The term *Eulimene*, however, had been previously used by Peron for a genus of *Acalepha*, and though the name *Artemia* is liable to objections from its construction (*Artemia* for *Artemis*), I prefer adopting it to burdening the nomenclature with another synonym.

Five species have been described.

1. *ARTEMIA SALINA*, Leach. *Antennis inferioribus maris validis,*

compressis, articulo secundo lato apice acuminato, basali unidentato; segmento caudali setigero; ovario quadrilaterali.

Long. 6 lin.

Pro Synonymis vide "Baird's British Entomostraca," et adde:—

Eulimene albida, Latreille, Nouv. Dict. d'Hist. Nat. x. 535; Cuv. Règn. An. 2nd edit. iv. 178; Desmarest, Cons. gen. Crust. 394; Risso, Hist. Nat. Eur. Mérid. v. 165; Lamarck, Hist. Nat. An. s. Vert. 2nd edit. v. 199 (note); M. Edwards, Hist. Nat. Crust. iii. 371; White, Catalogue of Crustacea, Brit. Mus.

Artemia Eulimene, Leach, Dict. Sc. Nat. xiv. 543.

Hab. In salinis ad "Lymington," in Anglia; prope "Montpellier," in Gallia; in Mediterraneo, prope "Nice," &c.

This species, which seems to have been first observed by M. Schlosser, in the salt-pans at Lymington, is nearly white, slender, and about half an inch in length. The abdomen is long, fully as long as the body, and the caudal segment is simply divided into two small lobes, which give origin to several short setæ. The inferior antennæ in the male are divided into two articulations, the basal one of which has on its inner edge at about half of its length, a short, stout, conical tooth. The terminal joint is broad, bends nearly at a right angle about the middle of its length, and terminates in a sharp point. In the female these organs resemble closely those of the preceding genus. The ovarian bag is large, of a quadrilateral shape, somewhat pointed at the two sides, and opens at both sides to allow the ova to escape.

The genus *Eulimene* was founded by Latreille to receive a small crustacean which was found by M. Cuvier amongst some marine animals which he had received from Nice. The chief character by which he distinguished the genus was the extreme shortness of the abdomen, which he considered terminated almost immediately after the last pair of feet in a swollen, semiglobular lobe filled with a blackish matter, and having springing from it a long thread-like body, of a dark colour also, and which he conjectured might be an oviduct. In the British Museum are many specimens of this little animal, received by Dr. Leach from M. Cuvier, and labelled by Dr. Leach himself, "*Artemia Eulimene*, from Nice, given by M. Cuvier." From a careful examination of this species I consider it specifically identical with the *Cancer salinus* of Linnæus, the *Artemia salina* of Leach. The specimens in the Museum are all females, and upon comparing them with specimens of *Artemia salina* from Lymington, no difference is perceptible, except that the specimens from Nice are rather whiter in colour and have the ovarian bag and abdomen of a darker hue. It is undoubtedly this dark-coloured ovarian bag that was mistaken by Latreille for the termination of the body, and the "long filament like an oviduct" which springs from it, is in reality the abdomen. The difference in colour evidently depends upon the food of the animal, the alimentary canal of the specimens from Nice being filled with a dark-coloured matter, thus giving the abdomen a blackish hue, while those from Lymington have the canal filled with matter of a brownish tint. In the second edition of the 'Règne Animal,'

in his notice of the *Artemia salina*, Latreille says, it is a species, "sur lequel nous n'avons encore que des renseignements très imparfaits." From this it would appear that he had never seen that species, and as most probably the specimens he had received from Cuvier were a little injured from having been preserved in spirits, it is not at all surprising that he did not observe the identity of the two.

2. *ARTEMIA MILHAUSENII*, Fischer. *Antennis inferioribus maris gracilibus, articulo secundo angusto; segmentis duobus cephalicis longis, segmento caudali bilobato, non setigero.*

Long. 5 lin.

Branchipus Milhausenii, Fischer, Bull. de la Soc. Imp. Nat. Moscou, vii. 1834.

Artemia Mulhausenii, M. Edwards, Hist. Nat. Crust. iii. 370.

Artemia salina, Rathke, Faun. der Krym. 395. t. 6. f. 14-21.

Hab. In lacu salino "Loak" in Crimea; *M. Milhausen*.

This species, which was found by M. Milhausen in the salt-water lake of Loak in the Crimea, is about 5 lines in length and of a brown colour. The inferior antennæ of the male are much more slender than in the preceding species. The basal joint has no tooth and the terminal joint is cylindrical and pointed. The superior antennæ, according to Fischer, have the first joint very short and of an obconical form, and the two cephalic segments are considerably elongated. The abdomen is slender, shorter than the body, and is terminated by a simple bilobed process not furnished with setæ. The feet are rather long, and the terminal joint is armed with long filaments.

In the month of July these animals abound in great numbers; they fill the lake and give the water a brick-red colour.

3. *ARTEMIA GUILDINGII*, Thompson. *Species hæc, reperta in India Occidentali, delineata est a Domino Thompson in 'Zoological Researches,' sed non descripta, necnon satis accurate delineata est.*

Artemis Guildingi, Thompson, Zool. Research. Fasc. v. t. 1. f. 11.

Hab. In insula "St. Vincent's," in India Occidentali; *Rev. L. Guilding*.

This species is figured by Mr. Thompson, but not sufficiently described to enable me to give a good diagnosis of it. It was found at St. Vincent's in the West Indies by the Rev. Lansdowne Guilding, by whom its natural history was intended to have been more fully detailed. The body seems to be thick and the abdomen shorter than the body and stout. The caudal segment does not appear to be lobed nor setigerous. The cephalic segment is conical in shape, and the superior antennæ, according to Mr. Thompson's figure, consist each of four joints. The ovarian sac consists, according to the same authority, of two articulations.

4. *ARTEMIA ARIETINA*, Fischer. *Antennis inferioribus maris validis, articulo secundo latissimo, basali unidentato; antennis superioribus apice furcatis, setigeris; segmento caudali bilobato, lobis setigeris.*

Long. 4-6 lin.

Artemia arietina, Fischer, Middendorff's Sibirische Reise, ii. 156. t. 7. f. 31-35 (1851).

Hab. In vicinitate urbis Odessæ; *Middendorff*.

This species, which was found by Middendorff in the neighbourhood of the town of Odessa, is about from 4 to 6 lines in length. It approaches very near to the *Artemia salina*. The inferior antennæ in the male have the second joint very broad and flat and sharp-pointed. The superior antennæ are forked at the extremity, the forks unequal, each having two terminal setæ. The eye is very large and the caudal segment is bilobed, each lobe terminating in three pretty long setæ.

5. *ARTEMIA KOPPENIANA*, Fischer. *Antennis duabus ut in præcedente; segmento caudali non lobato nec setigero.*

Long. $2\frac{1}{4}$ -3 lin.

Artemia Koppeniana, Fischer, Middendorff's Sibirische Reise, ii. 157. t. 7. f. 36-37 (1851).

Hab. In Russia Australi; *Koppen*.

This species was found in Southern Russia by M. Koppen, and is only from $2\frac{1}{4}$ to 3 lines in length. Its principal difference consists in the form of the caudal segment, which is not lobed at the extremity, but is simply squared off and has no setæ springing from it.

Genus POLYARTEMIA, Fischer.

Corpus molle, gracile; segmentum caudale pinnis nullis instructum; pedes branchiales, paribus novemdecim. Antennæ inferiores maris bi-articulatæ, articuli terminales in ramos duos divisi et dentibus numerosis instructi; articuli basales appendicibus tenuibus armati.

Polyartemia, Fischer, Middendorff's Sibirische Reise, ii. 154 (1851).

This genus was founded by Sebastian Fischer to receive a species of the family *Branchipodidæ*, which differs in some respects from any of the genera of the family. It is furnished with appendages to the male inferior antennæ, which are two-jointed, approaching in this respect to the genus *Chirocephalus*—and it is destitute of caudal fins, resembling in this structure the genus *Artemia*—but the number of feet is nineteen pairs, and the male inferior antennæ have each of the terminal joints divided into two broad, flat branches, the one overlying the other like the branches of a pair of scissors. These branches are furnished on their edges with three or four rows of sharp teeth. The basal joint has a rounded process at about half its length armed with short setæ. The appendages attached to these organs are conical in form, thin, and apparently not provided with digitiform or flabelliform appendages. The abdominal portion of the body is shorter in proportion than in any of the other genera, and the ovarian sac of the female is moderately large and lies close upon the abdomen, seeming when viewed from above to be amalgamated with it. The male organ is cylindrical, four-jointed, and is contained in a sheath which is serrated on one side.

Polyartemia forcipata, Fischer, Middendorff's Sibirische Reise, ii. 154. t. 7. f. 24-28.

As this is the only species yet known, the generic characters given above will suffice.

Hab. In fluviis "Trundra, Taimyr et Boganida" in Siberia; et prope "Tri-Ostrowa" in Lapponia; *Middendorff*.

Species hujus familiæ, incertæ sedis aut quæ dubiæ sunt—

GENUS BRANCHIPUS?

1. *Branchipus ferox*, M. Edwards, Hist. Nat. Crust. iii. 369.

This species, according to M. Milne-Edwards, has neither the antenniform appendage attached to the inferior antennæ of the male of *Branchipus*, nor the complicated apparatus of *Chirocephalus*. They are pointed at the extremity, and thus differ also from these organs in *Streptocephalus*. The description given of this species by M. Edwards is so short, that it is difficult to say to what genus it may belong. His description is as follows:—"Cornes céphaliques sans appendice près du côté interne de leur base, pointues au bout et sans dent sur le bord externe. Abdomen lisse, nageoires caudales longues et étroites. Longueur environ 15 lignes. Habite les eaux douces aux environs d'Odessa."

2. *Cancer paludosus*, Müller, Zool. Dan. ii. 10. t. 48. f. 1-8; Herbst, Krabben, ii. 118. t. 35. f. 3-5.

Most authors have assumed this species to be the same as the *Chirocephalus diaphanus*. As M. Milne-Edwards very properly observes, however, the figure of this species given by Müller shows no appearance of the complicated apparatus belonging to the male antennæ of *Chirocephalus*. There does not appear either to be any antenniform appendage belonging to them, as in the genus *Branchipus*, and the structure of the antennæ themselves removes it also from the genus *Streptocephalus*.

3. Some fragments of a species of Branchipode were brought by Sir John Richardson from Cape Krusenstern in N. America, collected there by Mr. J. Rae in August 1849, along with the *Apus glacialis*. They consist of portions of two males and two females. The male antennæ are two-jointed; the basal joint is thick, and has at its lower part near its junction with the second a row of small teeth; the second joint is cylindrical and pointed. The female horns or antennæ are flat apparently, and have a short hooked spine at the extremity. The caudal fins are rather long and fringed with long cilia. In some respects this species resembles the figure of the *Cancer paludosus* of Müller, but the fragments are too much decayed in the spirits to enable me further to describe it. It does not appear to have either antenniform appendages or any apparatus attached to the antennæ of the male.

Should these three species prove to be distinct, they may form another genus of this family, characterized by the want of these appendages and the toothed or serrated basal joint of the male cephalic horns.

Genus STREPTOCEPHALUS ?

4. A figure of a species of Branchipode was exhibited at a meeting of the Zoological Society by Dr. Nicholson in February 1851. The figure was not sufficiently accurately made to enable the species or genus to be made out. In all probability, however, it may prove to be a species of *Streptocephalus*. It is a native of India and inhabits freshwater ponds.

Genus ARTEMIA ?

M. Audouin, in the Ann. de la Soc. Ent. de la France, v. Bull. 61, 1836, mentions a species of *Artemia* closely allied to *Art. salina*, as inhabiting the salt lakes of Egypt. In the Ann. des Sc. Nat. 2nd ser. vi. 230, he again mentions the fact, that numbers of *Artemia* have been found in the "lacs de natron" in Egypt; but no further description has ever been given of them.

Family LIMNADIADÆ.

Genus LIMNADIA.

Sp. LIMNADIA ANTILLARUM, nov. sp. (Tab. XXIII. fig. 1).

Carapace valves of a rounded oval shape, and of a transparent whitish colour; prominent on dorsal margin where the muscular attachment of the body takes place, sloping from thence rather suddenly towards anterior extremity where it forms a somewhat blunt point, and more gradually to posterior extremity, which, as well as ventral margin, is rounded. Antennules bluntly serrated or crenulated on their upper edge, rather shorter than the peduncles of large antennæ, which are stout and not half the length of the body. They consist of nine articulations, each having one or two long plumose setæ springing from the under edge, and one short stout spine at each joint on the upper edge. Caudal lamellæ of considerable length, and beset on upper edge with long plumose setæ to within a short distance of the tip, which is somewhat curved, sharp-pointed and slightly serrated on upper edge. Feet 18 pairs.

The structure of the carapace is the same as in *Limnadia Hermannii*, the surface being covered with minute dots or puncturations.

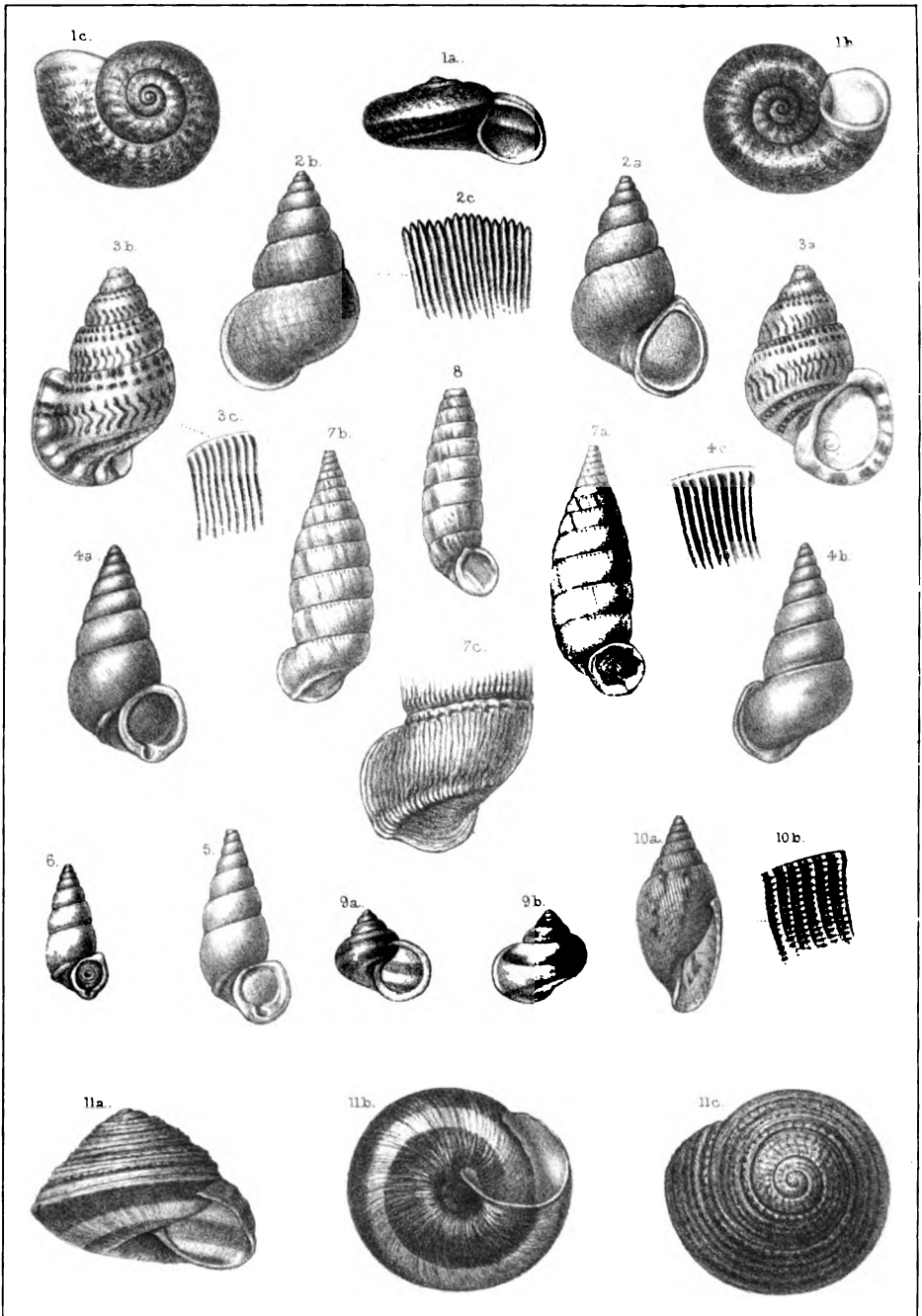
This species differs from the two others in the shape of the carapace and in having the setæ of antennæ and tail plumose.

Hab. St. Domingo, West Indies; *M. Sallé*. Mus. Brit.

Genus ESTHERIA.

Sp. ESTHERIA DALLASII, nov. sp. (Tab. XXIII. fig. 5).

Carapace valves shortly obovate and flat, upper margin from the beaks to two-thirds of its length almost straight; anterior extremity rather broader than posterior. Beaks prominent and situated near anterior extremity. The shell is of a light horny colour and very thin and translucent. Ribs elevated, smooth and numerous, about 20 in number. The intermediate spaces are concave and are covered all over with rough-looking spots of an irregular size and appearance, approaching



W H Baile

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Fig. 1 <i>Cyclostoma Bairdii</i> .	Pfr.	Fig. 6 <i>Cataulus Layardi</i> .	Gray.
2 <i>C. nobile</i> .		7 <i>Cylindrella Menkeana</i> .	Pfr.
3 <i>C. magnificum</i> Sallé.		8 <i>C. flammulata</i> .	"
4 <i>Cataulus pyramidatus</i> .	Pfr.	9 <i>Cyclostoma bicolor</i> .	
5 <i>C. eurytremata</i> .	"	10 <i>Achatina Richardi</i> .	"
Fig. 11 <i>Helix Launcestonensis</i> Reeve			

somewhat in structure to that of *brasiliensis*. It differs from that species however in size and in being of a more rounded oval shape.

Hab. Brazil? I am indebted for this species to Mr. Dallas, who found it in a collection of insects chiefly from Brazil. Mus. Brit.

February 24, 1852.

W. J. Broderip, Esq., F.R.S., V.P., in the Chair.

The following papers were read :—

1. DESCRIPTION OF A NEW SPECIES OF *HELIX* FROM VAN DIEMEN'S LAND. BY LOVELL REEVE, F.L.S. ETC.

(Mollusca, Pl. XIII.)

HELIX LAUNCESTONENSIS. *Hel.* testâ umbilicatâ, abbreviatâ, conoideâ, trochiformi, supernè rugosâ et ferruginâ, quasi epidermide indutâ, infra lævigatâ, nitente, intensè nigrâ, fasciâ distinctâ luteâ cingulatâ; spirâ obtusâ; anfractibus sex, supernè convexis, medio concavis, carinis lineisque gemmulatis undique cingulatis, peripheriâ acutè carinatâ, basi convexâ; umbilico mediocri, pervio, subprofundo; aperturâ obliquè lunari, peristomate tenui, vix reflexo, margine columellari breviter dilatato.

Hab. Launceston, Van Diemen's Land.

This very characteristic new species of *Helix* has just been received from Van Diemen's Land, where it was collected last summer by Mr. Ronald Gunn in a dense beech forest, north-east of Launceston. It differs materially from any of vast numbers of *Helices* now known to conchologists, especially in the different character of the upper and lower parts of the shell. The upper portion of the whorls has a rough rusty surface encircled by numerous finely beaded lines and keels; the lower surface is smooth and shining, jet-black, encircled by a distinct yellow band.

2. ON THE HABITS OF *STRIGOPS HABROPTILUS* OR *KAKAPO*. BY DAVID LYALL, M.D., R.N., LATE SURGEON TO H.M.S. *ACHERON*.

(Aves, Pl. XLVI.)

Although the *Kakapo* is said to be still found occasionally on some parts of the high mountains in the interior of the north island of New Zealand, the only place where we met with it, during our circumnavigation and exploration of the coasts of the islands in H.M.S. *Acheron*, was at the S.W. end of the middle island. There, in the deep sounds which intersect that part of the island, it is still found in considerable numbers, inhabiting the dry spurs of hills or flats near the banks of rivers, where the trees are high, and the forest comparatively free from fern or underwood.

The first place where it was obtained was on a hill nearly 4000 feet above the level of the sea. It was also found living in communities on flats near the mouths of rivers close to the sea. In these places its tracks were to be seen resembling footpaths made by man, and leading us at first to imagine that there must be natives in the neighbourhood. The tracks are about a foot wide, regularly pressed down to the edges, which are two or three inches deep amongst the moss, and cross each other usually at right-angles.

The *Kakapo* lives in holes under the roots of trees, and is also occasionally found under shelving rocks. The roots of many New Zealand trees growing partly above ground, holes are common under them; but where the *Kakapo* is found many of the holes appeared to have been enlarged, although no earth was ever found thrown out near them. There were frequently two openings to these holes, and occasionally, though rarely, the trees over them were hollow for some distance up.

The only occasion on which the *Kakapo* was seen to fly was when it got up one of these hollow trees and was driven to an exit higher up. The flight was very short, the wings being scarcely moved; and the bird alighted on a tree at a lower level than the place from whence it had come, but soon got higher up by climbing, using its tail to assist it.

Except when driven from its holes, the *Kakapo* is never seen during the day, and it was only by the assistance of dogs that we were enabled to find it.

Before dogs became common, and when the bird was plentiful in inhabited parts of the islands, the natives were in the habit of catching it at night, using torches to confuse it. It offers a formidable resistance to a dog, and sometimes inflicts severe wounds with its powerful claws and beak. At a very recent period it was common all over the west coast of the Middle Island, but there is now a race of wild dogs said to have overrun all the northern part of this shore, and to have almost extirpated the *Kakapos* wherever they have reached. Their range is said to be at present confined by a river or some such physical obstruction, and it is to be feared that if they once succeed in gaining the stronghold of the *Kakapo* (the S.W. end of the island) the bird may soon become extinct.

During the latter half of February and the first half of March, whilst we were amongst the haunts of these birds, we found young ones in many of the holes, frequently only one, never more than two, in the same hole. In one case where there were two young ones I found also an addled egg. There was usually, but not always, an old bird in the same hole with the young ones.

They build no nest, but simply scrape a slight hollow amongst the dry dust formed of decayed wood. The young were of different ages, some being nearly fully fledged, and others covered only with down. The egg is white and about the size of a pigeon's. (Aves, Pl. XLVI.)

The cry of the *Kakapo* is a hoarse croak, varied occasionally by a discordant shriek when irritated or hungry. The Maories say that during winter they assemble together in large numbers in caves, and

at the times of meeting, and, again before dispersing to their summer haunts, that the noise they make is perfectly deafening.

A good many young ones were brought on board the ship alive. Most of them died a few days afterwards, probably from want of sufficient care; some died after being kept a month or two, and the legs of others became deformed after they had been a few weeks in captivity. The cause of the deformity was supposed to be the want of proper food, and too close confinement. They were fed chiefly on soaked bread, oatmeal and water, and boiled potatoes. When let loose in a garden they would eat lettuces, cabbages and grass, and would taste almost every green leaf that they came across. One, which I brought within six hundred miles of England (when it was accidentally killed), whilst at Sydney, ate eagerly of the leaves of a *Banksia* and several species of *Eucalyptus*, as well as grass, appearing to prefer them all to its usual diet of bread and water. It was also very fond of nuts and almonds, and during the latter part of the homeward voyage lived almost entirely on Brazilian ground-nuts.

On several occasions the bird took sullen fits, during which it would eat nothing for two or three days at a time, screaming and defending itself with its beak when any one attempted to touch it. It was at all times of an uncertain temper, sometimes biting severely when such a thing was least expected. It appeared to be always in the best humour when first taken out of its box in the morning, hooking on eagerly with its upper mandible to the finger held down to lift it out. As soon as it was placed on the deck it would attack the first object which attracted its attention—sometimes the leg of my trowsers, sometimes a slipper or a boot. Of the latter it was particularly fond: it would nestle down upon it, flapping its wings and showing every symptom of pleasure. It would then get up, rub against it with its sides, and roll upon it on its back, striking out with its feet whilst in this position.

One of these birds, sent on shore by Capt. Stokes to the care of Major Murray of the 65th Regiment at Wellington, was allowed to run about his garden, where it was fond of the society of the children, following them like a dog wherever they went.

Nearly all the adult Kakapos which I skinned were exceedingly fat, having a thick layer of oily fat or blubber on the breast which it was very difficult to separate from the skin. Their stomachs contained a pale green, sometimes almost white, homogeneous mass, without any trace of fibre in it.

There can be little doubt but that their food consists partly of roots (their beaks are usually more or less covered with indurated mud), and partly of the leaves and tender shoots of various plants. At one place where the birds were numerous we observed that the young shoots of a leguminous shrub growing by the banks of a river were all nipped off, and this was said by our pilot, who had frequented these places for many years in a whaling vessel, to be the work of the Kakapo.

Their flesh is white, and is generally esteemed good eating.

No. CCXL.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

3. ON TWO NEW SPECIES OF SOUTH AMERICAN BIRDS.

By PHILIP LUTLEY SCLATER.

(Aves, Pl. XLVII. XLVIII.)

1. *CULICIVORA BOLIVIANA*, Sclater. *C. supra plumbea; infra alba plumbeo paululum tincta; ventre niveo; fronte regione oculari et genis nigris; alis nigricantibus, tectricibus et secundariis latè, primariis strictissimè albo limbatis; caudæ nigræ lateralibus rectricibus albo terminatis 4; extimis ferè omnino albis—rostro et pedibus nigris.*

Long. tota $4\frac{1}{2}$; alæ $2\frac{1}{2}$; caudæ $2\frac{1}{4}$.*Hab.* Bolivia (Bridges), D'Orbigny.

The present bird is the fifth of this interesting genus, of which the best known are the *C. cærulea* (Linn.) of the United States, and the *C. dumicola* (Vieill.) of Brazil and Paraguay. The Prince of Canino notices two other previously unrecognized species in his 'Conspectus Avium,' p. 316. These I have never seen; but his fifth species, the *C. budytoides*, De la Fresnaye, of which I have examined the type, belongs, I believe, more properly to another genus. There are specimens of the present species in the British and Paris Museums, and in the fine collection of the Baron de la Fresnaye at La Fresnaye near Falaise.

2. *PIPRA FLAVO-TINCTA*, Sclater. *P. alba, flavo pallidè tincta; pileo alis caudæque cum dorso inferiore nigris; uropygio cum ventre viridescente-cinereis; rostro nigro; pedibus flavis.*

Long. tota $3\frac{1}{2}$; alæ $1\frac{1}{2}$; caudæ $1\frac{1}{4}$.*Hab.* S^{te} Fe de Bogota.

This species is very like the common *Pipra manacus*, but is smaller, and has the white parts of its plumage tinged with yellow and much less black on the back. There are examples in the Museum of the Jardin des Plantes at Paris and of the Baron de la Fresnaye.

March 9, 1852.

John Gould, Esq., F.R.S., in the Chair.

The following papers were read:—

1. DESCRIPTIONS OF NEW SPECIES OF CLERIDÆ, FROM ASIA, AFRICA AND AUSTRALIA.

By J. O. WESTWOOD, F.L.S., PRES. ENT. SOC. ETC.

(Annulosa, Pl. XXIV. XXV. XXVI. XXVII.)

The fine illustrated memoirs on the family *Cleridæ* lately published by Dr. Klug and the Marquis Spinola, and the Catalogue of the same family still more recently issued by the British Museum, from the

pen of Mr. Adam White, have made us acquainted with a great number of exotic species belonging to this interesting family; but, as might be supposed to be the case, the two former works contain but few species from Australia, India and Western Africa, in which our private and public collections are very rich; whilst, on the contrary, they abound in American species, in which, as a whole, our collections have been hitherto comparatively poor, our collectors in South America having for the most part confined their attention to the Lepidoptera, in which order we now I believe rival any of the continental museums. I have therefore thought it would be serviceable, by way of Supplement to the works above-mentioned, to give descriptions of fifty-two additional species, which I have selected from the collections of the Rev. F. W. Hope, Captain Parry and my own; offering to those two gentlemen my best thanks for the use of their collections so unrestrictedly permitted to me. The major part of these species are represented in the four accompanying plates, the majority being illustrated by details representing the 4-jointed maxillary and the 3-jointed labial palpi, and the tarsi or tarsal ungues. Short characters of fifteen of the species were published from my notes by Mr. A. White in his List of the *Cleridæ*. I have added a figure of his brilliantly coloured *Necrobia eximia*, as well as the description and figure of a remarkable insect, under the name of *Enoplium pustuliferum*, from New Zealand, recently obtained for the British Museum Cabinet, which is especially interesting on account of its geographical position, the species of the group to which it appears to belong being only hitherto known as natives of Europe and America.

A. AFRICAN SPECIES*.

1. *ERYMANTHUS HORRIDUS*, Hope MS. (Pl. XXIV. fig. 12.)
Totus niger nitidus, sparsim setosus, thorace et elytris variegatus, his postice dilatatis tuberculisque variis rufo-piceis rufo-setulosus instructis; femoribus anticis clavatis.—Long. corp. lin. 11.

Hab. Cape Palmas (*D. Savage*).

Corpus elongatum subdepressum, totum nigrum nitidum. Caput ante oculos utrinque oblique impressum, vertice tuberculo parum elevato, rotundato, impressione parva antica notato. Antennæ nigrae articulis intermediis piceis. Mandibulae nigrae. Os piceum; palpi maxillares articulo ultimo mediocriter, palpi labiales articulo ultimo valde securiformi. Pronotum valde irregulare, utrinque tuberculis duobus latis transversis, fossula media longitudinali, separatis, laeve, vix punctulatum, et paulo ante apicem constrictum. Scutellum parvum, in medio impressione rotunda notatum. Elytra postice rotundato-dilatata, dorso irregularia, singulo inter humeros et medium carina obliqua elevata, tuberculis numerosis, parvis, elevatis, singuloque puncto profundo impresso, tuberculis pone medium elytrorum sim-

* Captain Boheman has published the descriptions of thirty-one new species from South Africa in his 'Insecta Caffrae,' part 2, 1851.

plicibus, nonnullis vero majoribus, piceo-rufis quorum duo pone medium elytrorum majora et rufo-setulosa. Pedes nigri, tarsi piceis quasi 4-articulatis, articulis intermediis subtus profunde bilobatis, unguibus simplicibus; femoribus anticis magnis clavatis tibiisque curvatis, intus linea setarum brevium instructis. Corpus subtus nigrum nitidum parce setosum.

2. CLERUS SANGUINALIS, Westw. (Pl. XXV. fig. 7.) *Elongatus, subcylindricus, fulvus, elytris sanguineis immaculatis, antennarum articulis intermediis, femoribus 4 anticis apice, tibiis tarsisque, pedibusque posticis nigris*.—Long. corp. lin. 5.

Hab. in Natalia. In Mus. Hope.

Caput mediocre, convexum, læve, impressionibus duabus parvis rotundatis inter oculos. Antennæ graciles dimidio pronoti parum longiores, nigrae articulis quatuor basalibus ultimoque lutescentibus, tribus ultimis sensim majoribus, ultimo apice conico. Mandibulae parvae nigrae. Os fulvum; palpi maxillares, breves, graciles, labiales majores, articulo ultimo valde securiformi. Prothorax capite paulo latior, convexus, lævis, nitidus, parce punctatus et setosus, prope marginem anticum et posticum transversim impressus, lateribus in medio sensim rotundatis. Elytra elongata, angusta, subcylindrica, undique punctatissima punctis minutis, sanguinea, immaculata. Corpus infra fulvum abdomine magis sanguineo nitido; pedes graciles cum trochanteribus omnibus femoribusque quatuor anticis fulvis, his apice nigris; tibiis tarsisque 4-anticis, pedibusque posticis nigris, tarsi 5-articulatis, articulo 1mo infero, intermediis profunde bilobatis, unguibus simplicibus.

3. CLERUS (STIGMATIUS) NEBULIFER, Westw. (Pl. XXVI. fig. 4.) *Piceus, irregulariter cinereo-sericans, macula magna communi pone medium elytrorum, apiceque suturae pallide sericeis, elytris elongatis subdepressis dimidiatim striato-punctatis, pone medium sensim angustatis*.—Long. corp. lin. 5.

Hab. in Natalia. In Mus. Westw.

Caput nigro-piceum tenuissime punctatum, setis cinereo-griseis sericeis obsitum. Antennæ graciles rufo-piceae articulis basalibus elongatis, terminalibus mutilis. Mandibulae nigrae. Os cum palpis rufo-testaceum; palpi maxillares parvae articulo ultimo brevi attenuato. Palpi labiales articulo ultimo magno securiformi. Pronotum piceum antice magis rufescens, antice et postice linea transversa impressa, lateribus in medio rotundatis, postice parum angustius, subconvexum, tenuissime punctatum et setosum. Elytra elongata, subdepressa, sub lente punctis minimis undique impressa, picea; basi, sutura et medio magis rufescentibus, dimidio basali irregulariter cinereo-setoso et punctato striato; striis praesertim internis prope medium evanescentibus; dimidio apicali plaga magna seu fascia pone medium cum sutura et apice setosa; linea punctorum majorum distantium prope suturam. Pedes longi, rufo-picei, femoribus anticis obscurioribus. Tarsi 5-articulati articulo basali parvo, subtus producto. Ungues simplices basi latiores. Corpus infra castaneum.

4. CLERUS (STIGMATIUS) DORSIGER, Westw. (Pl. XXVI. fig. 8.) *Rufo-piceus griseo-setosus, elytris subelongatis subconvexis e medio ad apicem sensim attenuatis, striato-punctatis supra disco nigricante plaga magna communi media grisea, lateribus et apice griseis.*—Long. corp. lin. 3½.

Hab. apud Sierram Leonum (D. Afzelius, Schönherr). In Mus. Hope.

Præcedenti brevior, latior et magis convexus. Caput et prothorax ut in præcedente, at magis castanea; palpis flavescentibus labialibus longis. Antennæ modice elongatæ, graciles, castaneæ, articulis 5–11 sensim latioribus compressis subovalibus. Elytra sub lente tenuissime punctata, e basi ad apicem striato-punctata punctis striarum versus basin elytrorum majoribus, piceo-rufa, disco nigricanti, setis cinereis irregulariter, præsertim ad latera, oblecta; plaga magna communi media grisea, gutta parva subapicali, apicibusque cinereo-setosis. Pedes castanei griseo-setosi. Corpus infra pallide castaneum.

5. TILLUS (MACROTELUS, Klug; MONOPHYLLA, Spin.) UNIFORMIS, Westw. (Pl. XXIV. fig. 9.) *Castaneus, angustus, subcylindricus, antennis tibiis tarsisque nigricantibus, elytrorum lateribus in medio macula parva triangulari apiceque obscuris.*—Long. corp. lin. 4.

Hab. apud ripas fluvii Gambiæ. In Mus. Hope.

Corpus elongatum subcylindricum tenuissime et rugose punctatum. Caput pronoto latius, oculis magnis nigris. Antennæ articulis 1–9 brevibus, 1mo castaneo, reliquis nigricantibus, 6–9 paulo latioribus, ultimo (10mo) pronoto parum longiori, compresso, ensiformi. Palpi flavescentes, maxillares parvi tenues, labiales longiores articulo ultimo valde securiformi. Prothorax angustus, cylindricus, medio parum latior, lateribus paulo rotundatis, valde setosis, disco transverse tenue ruguloso, striola tenui transversa impressa prope basin. Elytra elongata, nitida, subcylindrica, capitis latitudine, e basi ad medium striato-punctata; dimidio apicali tenuissime ruguloso-punctato, macula parva triangulari in medio lateris apiceque piceis. Pedes pallide castanei, femoribus apice tibiisque obscurioribus. Tarsorum unguibus bifidis basique angulato-dilatatis.

Obs. *Tillus compressicornis*, Kl. Mon. pl. 2. fig. 3. fœmina speciei huic proxima videtur.

6. TILLUS (MACROTELUS?) SUBNOTATUS, Westw. *Elongatus, subcylindricus; totus castaneo-rufus, elytris punctato-striatis, dimidio apicali fere lævi, fasciaque pallida fere obsoleta mediana ad suturam interrupta, antennis nigris articulis 5–10 sensim serrato-dilatatis, pedibus rufo-castaneis.*—Long. corp. lin. 3.

Hab. apud Promont. Bonæ Spei. In Mus. Westwood.

Till. compressicorni, Kl., affinis et forsitan fœmina *Macroтели*, statura *T. uniformis*, at brevior. Caput et pronotum sub lente punctata, punctis transverse confluentibus. Mandibulæ castaneæ apice nigrae. Palpi pallide fulvi, hujus generis. Antennæ piceæ articulis

4 basalibus tenuibus, 5–10 sensim majoribus compressis intus dilatatis, serratis, 11mo tribus præcedentibus fere æquali, oblongo-ovali. Prothorax subcylindricus, lateribus in medio parum rotundatis dorso transverse rugosus. Elytra elongata versus apicem paullo latiora, dimidio basali striato, punctato, apicali fere lævi, tenuissime punctato, lateribus in medio macula conica pallida vix distincta, ad suturam haud extensa, notata. Pedes pallide rufo-castanei. Ungues subtus dente acuto basique dilatato armati.

7. *TILLUS AFZELII*, Westw. (Pl. XXIV. fig. 7.) *Læte cyaneus, nitidus, punctatus, longe setosus, antennis luteo-piceis articulis apicalibus multo latioribus, pedibus apiceque elytrorum fulvo-luteis*.—Long. corp. lin. 2.

Hab. apud Sierram Leonum (*D. Afzelius, Schönherr*). In Mus. Hope.

Caput convexum, tenue punctatum, cyaneum, oculi magni. Antennæ longitudine pronoti 11-articulatæ articulis 1–4 gracilibus, 5–10 sensim dilatatis, compressis, apice interno acuto, 11mo longitudine trium præcedentium, oblongo-ovato compresso. Labrum luteum. Mandibulæ castaneæ apice nigre. Palpi lutei hujus generis. Prothorax elongatus, longe setosus, vage punctatus, lateribus in medio rotundato-dilatatis. Elytra prothorace latiora, subparallela, læte cyanea, apicibus late luteis; striato-punctatis, punctis magnis at paullo pone medium oblitteratis. Pedes fulvi tibiis tarsisque obscurioribus, unguibus ut in *T. uniformi* formatis. Caput et thorax subtus nitida, cyaneo-iridia. Abdomen læte fulvum.

8. *THANASIMUS CAPICOLA*, Westw. *Niger, subnitidus, rude punctatus, antennis fulvis gracilibus, elytris nigris basi rufis, fascia media, alteraque subapicali albidis*.—Long. corp. fere lin. 2.

Hab. apud Promont. Bonæ Spei. In Mus. Hope.

Depressus, niger, capite et pronoto rude punctatis, labro palpis et antennis fulvis, his gracilibus, brevibus, articulis tribus apicalibus dilatatis, compressis. Palpi maxillares filiformes minuti, labiales majores securiformes. Elytra punctato-striata albido-setosa, punctis in parte rufa majoribus, pone medium magis irregularibus et minus determinatis, tertia parte basali rufa, parte colorata in utroque elytro oblique truncata; parte relicta elytrorum nigra, purpureo parum tincta, fascia media communi alteraque subapicali (in medio interrupta) albidis. Pedes nigricantes albido-setosi, tarsis piceis.

9. *THANASIMUS IRREGULARIS*, Westw. (Pl. XXV. fig. 4.) *Piceus, elytris luteis fusco irregulariter tessellatis, punctatis; antennis pallide castaneis, femoribus fulvis apice nigris, tibiis apicibus, tarsisque fulvis*.—Long. corp. lin. 4½.

Hab. apud Promont. Bonæ Spei. In Mus. Parry.

Oblongus, subdepressus, parum nitidus, mediocriter setosus. Caput piceum tenuissime punctatissimum, labrum luteum, mandibulæ piceæ; antennæ castaneæ, graciles, articulis tribus ultimis sensim at paullo majoribus, ultimo apice acuminato. Palpi lutei, maxillares filiformes

minuti, labiales valde securiformes. Prothorax brevis fere truncato-cordatus punctis minutis undique impressus, disco in lobos vel areas subrotundas divisus. Elytra mediocriter elongata, subdepressa, subparallela, lutea, fusco irregulariter maculatis maculis ad suturam et latera confluentibus, grosse punctata punctis in lineas longitudinales subregulares dispositis. Pedes fulvi, femorum apice extremo et tibi-
arum basi nigris, ungues tarsorum simplices. Caput et thorax subtus castanei, abdomen luteum.

B. INDIAN SPECIES.

10. *CLADISCUS LONGIPENNIS*, Westw. (Pl. XXIV. fig. 1.) (White, App. Cat. Cleridæ, p. 52.) *Elongatus, cylindricus, niger, nitidus, nigro-setosus, capite et pronoto sanguineis, antennarum nigrarum articulis 3-10 latis serratis; prothorace postice attenuato et constricto; elytris fulvis longissimis, profunde striato-punctatis*.—Long. corp. lin. $6\frac{1}{2}$.

Hab. in Himalaya. In Mus. Westwood.

Caput valde convexum, fere glabrum, sanguineum, clypeo carina longa recta transversa marginato. Oculi parvi subreniformes, mandibulæ, antennæ et palpi nigri. Antennæ latæ, profunde serratæ compressæ. Palpi maxillares breves, filiformes; labiales longi, securiformes. Prothorax obconicus vel postice attenuatus, et prope basin profunde constrictus, lobis duobus elevatis in medio marginis basalibus. Elytra cylindrica, angusta, profunde striato-punctata, striis 10 in singulo elytro. Pedes nigri, graciles, longe setosi, tarsis 5-articulatis, articulo basali pedum posticorum 2do parum longiore, 3tio et 4to subtus magis dilatatis; ungues valde curvati, acuti, intus basi late et acute producto.

11. *CLADISCUS PARRIANUS*, Westw. (Pl. XXIV. fig. 2.) *Angustus, cylindricus, rufus, pallide setosus, mandibulis, antennis, pedibus, apiceque lato elytrorum nigris, his striato-punctatis punctis versus apicem obsoletis*.—Long. corp. lin. 5.

Hab. in India orientali. In Mus. Parry.

Omnino statura præcedentis, differt colore corporis, elytrorum apice nigro sublævi, palpisque fulvis. Caput sanguineum fere læve, nitidum. Mandibulæ et antennæ nigrae, hæ subbreves, articulis 3-10 dilatato-serratis fere triangularibus, 11mo brevi ovali. Os cum palpis pallide fulvum. Prothorax sublævis, obconicus, prope basin valde constrictus. Elytra elongata, cylindrica, striato-punctata; punctis ante apicem obsoletis, apice ipso paullo rugoso et transversim truncato; rufo-fulva, tertia parte apicali nigra. Pedes nigri coxis fulvis, ungues lati, basi interne in dentem latum acutum producto. Corpus subtus fulvum, nitidum, metasterno sanguineo. *Cl. gracili* similis; forsitan femina.

12. *CLADISCUS BIPECTINATUS*, Westw. (Pl. XXIV. fig. 3.) *Angustus, cylindricus, fulvo-rufus, punctatus; antennis, oculis, pedibus, apiceque elytrorum late nigris, antennarum articulis 4-10 longe bipectinatis, prothorace ante et pone medium con-*

stricto; postice viz angustiori; elytris striato-punctatis et costatis.—Long. corp. lin. 5.

Hab. in Malabar. In Mus. Melly.

E præcedentibus differt antennis bipectinatis elytrisque costatis. Caput prothorace latius, rufo-fulvum, antennæ nigræ, articulo 3tio intus producto, 4to ad 10um ramos duos longos emittentibus, 11mo elongato. Prothorax elongatus, sublævis, rufo-fulvus, ante et pone medium mediocriter constrictus, lateribus in medio rotundatis. Elytra elongata, subcylindrica, fulva, apice lato nigro, singulo costis tribus elevatis longitudinalibus, inter costas striis duabus punctorum; pedes nigri longe setosi; tarsis articulis 4 basalibus subtus lobatis.

13. CLERUS (XYLOBIUS?) ALBO-VARIUS, Westw. (Pl. XXIV. fig. 4.) *Elongatus, gracilis subdepressus, niger, punctatissimus, capite inter oculos, fascia antica transversa et punctis duobus lateralibus posticis pronoti, lunulis duabus humeralibus maculisque septem (3tia majori communi) elytrorum albo-squamosis; horum apicibus truncatis; antennis brevissimis pedibusque pallide fulvis.*—Long. corp. lin. 5.

Hab. in Himalaya. In Mus. Westwood.

Caput latum, oculis magnis, punctatissimum antice albo-sericans. Labrum et mandibulæ ad basin fulvescentes. Antennæ capite viz longiores, gracillimæ, articulis tribus ultimis evidenter latioribus. Palpi pallide fulvescentes, maxillares minuti filiformes, labiales elongati, articulo ultimo longe securiformi. Prothorax oblongus, punctatissimus, æneo-niger, versus marginem anticum et basin paullo constrictus, fascia antica maculis duabus lateralibus conicis posticis albo sericantibus. Elytra elongata, undique punctatissima, apice extremo truncato lateribus subparallelis, dorso purpureo parum tincto, lunulis duabus basalibus (scutellum includentibus) punctis duobus parvis ante medium, macula magna rotundata communi; duabus obliquis pone medium alterisque duabus ad apicem albo squamosis. Pedes graciles, fulvi, femoribus posticis supra, tibiisque extus piceis, his prope apicem in angulum productis; tarsi 5 articulati, articulis 3tio et 4to infra magis lobatis. Ungues acuti, basi in dentem latum producti. Corpus infra nigrum, lateribus thoracis et segmentorum abdominalium albo notatis.

14. CLERUS (XYLOBIUS?) DULCIS, Westw. (Pl. XXIV. fig. 6.) *Angustus, cyaneus, punctatissimus, labro albido, antennis, palpis, pedibusque pallide fulvis, capite inter oculos, pronoti maculis 4, scutello, elytrisque maculis 14 albo squamosis.*—Long. corp. lin. 4.

Hab. in insula Java. In Mus. Parry.

Caput pronoto latius, oculis magnis; vertice inter oculos albo squamoso; labrum luteum parvum. Mandibulæ nigræ. Antennæ brevissimæ, fulvescentes, articulis 4to, 5to, 6to obscurioribus; tribus ultimis sensim latioribus: palpi pallide fulvescentes. Prothorax ante et pone medium constrictus, lateribus in medio valde rotundatis, maculis duabus ante medium, alterisque duabus prope angulos posticos albo squamosis; scutellum album; elytra maculis 14 albo squamosis,

magnitudine fere æqualibus. Pedes longi, graciles, fulvescentes, longe setosi. Corpus infra chalybeum lateribus albo notatis.

15. TILLUS (TILLICERUS) CHALYBEUS, Westw. (Pl. XXIV. fig. 5.) (White, App. Cat. Cleridæ, p. 51.) *Valde convexus, elytris postice latioribus, cyaneus, nitidus, nigro-setosus, pronoto subgloboso pone medium valde constricto, elytris dimidio basali striato-punctatis, singulo pone medium gutta obliqua elevata purpurea (vel coccinea) glabra, apicibus lævibus griseo-setosis.*
—Long. corp. lin. 5.

Hab. Tenasserim. In Mus. Brit. et Westwood.

Caput parvum glabrum, mandibulæ parvæ, antennæ, et palpi nigri; palpi maxillares minuti, cylindrici, labiales mediocres, articulo ultimo elongato-triangulari. Antennæ fere prothoracis longitudine, articulis 1–10 intus serrato-dilatatis, subæqualibus, 11mo majori ovali. Prothorax subglobosus, lævis, nitidus, canali curvato transverso ante medium; postice valde constrictus. Elytra convexa, pone medium paullo latiora, cyanea, nitida; e basi fere ad medium striato-punctata punctis ad basin majoribus, dimidio apicali fere lævi, nigro-setoso; singulo gutta obliqua laterali mediana, elevata, glabra, purpurea vel coccinea, apiceque late griseo, setoso. Pedes breves, nigri; ungues bifidi, basi que dilatato.

16. CLERUS BENGALA, Westw. (Pl. XXV. fig. 11.) *Angustus, subdepressus, longe griseo-setosus, punctatissimus, rufo-testaceus; capite, mandibulis, femoribus, tibiis, et maculis 4 elytrorum nigris.*—Long. corp. lin. 4½.

Hab. in Bengalìa. In Mus. Ent. Soc. Lond.; (Kirby), Hope.

Caput nigrum prothoracis latitudine, convexum, punctatum; clypeus cum labro bilobo et palpis testaceus: antennæ graciles, longitudine mediocres, castaneæ, articulis tribus ultimis sensim majoribus: palpi maxillares minuti filiformes; labiales valde securiformes. Prothorax subovalis, subdepressus, prope marginem anticum et posticum constrictum; rufus tenuissime punctatus. Elytra rufo-testacea, punctatissima, et e basi paullo pone medium punctato-striata maculis duabus magnis semicircularibus, lateralibus, ante medium alterisque duabus magnis subquadratis pone medium. Pedes sat longi, nigri, tarsis pallide piceis 5-articulatis, articulo basali infero, unguibus simplicibus; corpus infra rufo-testaceum, metasterno castaneo.

17. CLERUS SUBFASCIATUS, Westw. (Pl. XXV. fig. 10.) (White, Suppl. Cat. Cleridæ, p. 56.) *Subdepressus, punctatissimus, piceus, elytris fulvis, nitidis, striato-punctatis; maculis duabus semicircularibus lateralibus ante medium, fasciaque lata pone medium (ad suturam interrupta), nigro-piceis; pedibus castaneo-fulvis, femoribus obscurioribus.*—Long. corp. lin. 4.

Hab. in India orientali. In Mus. Brit. et Westw.

Præcedenti proximus, at major, robustior et aliter coloratus. Caput piceum, fere læve, supra clypeum bi-impressum. Labrum subalbidum, mandibulæ piceæ apice nigræ; antennæ graciles, pallide castaneæ, articulis tribus apicalibus paullo crassioribus; palpi lutei labiales valde

securiformes; prothorax piceus, impressione curvata transversa prope marginem anticum, alteraque fere ad basin, lateribus in medio rotundatis; scutellum piceum. Elytra oblonga, nitida, punctatissima, fulva, e basi ad apicem striato-punctatis punctis ad basin elytrorum majoribus, 4 maculatis, maculis fere ut in specie præcedente dispositis. Pedes castaneo-fulvi, femoribus (nisi ad basin) piceis, unguibus simplicibus. Corpus infra piceum.

18. *THANASIMUS SELLATUS*, Westw. (Pl. XXV. fig. 8.) *Latior subdepressus, nigro-piceus nitidus, luteo-setosus, punctatissimus, elytris vix striato-punctatis, macula magna lutea irregulari transversa ante medium, alteraque parva communi subapicali, fulvis.*—Long. corp. lin. $5\frac{1}{2}$.

Hab. in India orientali. In Mus. Ent. Soc. Lond. (Kirby) et Hope. (Schönherr, Schneider.)

Caput piceo-nigrum, punctatissimum. Labrum luteum, mandibulæ nigræ, palpi castanei, maxillares parvi filiformes, labiales valde securiformes. Antennæ piceæ, articulis tribus apicalibus sensim majoribus, ultimo ovali, apice curvato acuto. Prothorax brevis, latus, lateribus rotundatis crebre punctatus, impressione transversa curvata ante medium, alteraque recta basali. Elytra picea crebre punctata, punctis in discum stria nonnullas indeterminatas formantibus, fascia lata irregulari dentata ante medium, maculaque transversa ovali subapicali, fulvis. Pedes robusti, picei, tarsorum unguibus simplicibus. Corpus infra piceo-castaneum, abdomine fulvo.

19. *CLERUS POSTICALIS*, Westw. (Pl. XXV. fig. 12.) *Totus fulvus, elytris fascia lata postica (ad suturam interrupta) nigra.*—Long. corp. lin. $4\frac{1}{2}$.

Hab. in India orientali. In Mus. Parry.

Crebre punctatus, luteo-setosus. Caput prothoracis latitudine rufo-fulvum, mandibulæ nigræ. Palpi fulvi, maxillares minuti filiformes, labiales valde securiformes. Antennæ graciles fulvo-castaneæ, articulis tribus apicalibus sensim majoribus. Prothorax lateribus rotundatis, ante medium et ad basin transversim impressus, fulvo-rufus, punctatissimus. Elytra fulva, fascia lata nigra ad suturam interrupta, pone medium punctatissima; e basi pone medium punctato-striata, punctis versus basin majoribus. Pedes fulvi, femoribus posticis pone medium tibiisque castaneis, tarsis 5-articulatis, articulo basali infero; unguibus simplicibus. Corpus subtus fulvum, margine postico segmentorum abdominalium luteo.

20. *OPILUS SORDIDUS*, Westw. (Pl. XXVI. fig. 9.) *Elongatus, depressus, piceus, elytris luteo-albidis, strigis duabus obliquis postice convergentibus ante medium, maculaque magna irregulari communi pone medium, piceis; pedibus luteo-albidis, apice femorum piceo.*—Long. corp. lin. $4\frac{1}{2}$ –7.

Hab. in India Orientali. In Mus. Parry.

Caput piceo-castaneum, punctatissimum, oculis magnis. Mandibulæ castaneæ apice piceæ. Antennæ pallide castaneæ, graciles, articulis tribus apicalibus sensim majoribus; palpi lutescentes, omnes

articulo apicali securiformi. Prothorax elongatus, subcylindricus, ante et pone medium subconstrictus, castaneo-piceus, antice magis rufescens, punctatissimus, luteo-setosus. Elytra elongata, depressa, pone medium paullo latiora, pallide albido-lutea, nitida, impresso-striata, striis e basi longe pone medium rude punctatis, strigis duabus gracilibus ante medium disci postice convergentibus, suturaque fere ad apicem castaneis, plagaque magna subovali communi pone medium, macula parva discoidali utrinque connexa. Corpus infra castaneum, lateribus metasterni nigris. Pedes lutei, luteo-setosi; apice femorum nigro.

21. *CLERUS ZEBRATUS*, Westw. (Pl. XXVI. fig. 11.) *Elongatus, depressus, piceus, breviter setosus, elytris rufescenti-albidis maculis duabus parvis basalibus, fascia angusta dentata ante medium, altera latiori submediana, antice tridentata, tertiaque angusta, acuta, denticulata, subapicali, fuscis; pedibus fusco albidoque annulatis*.—Long. corp. lin. 7.

Hab. in India Orientali. In Mus. Parry.

Caput parvum, punctatissimum, piceum, oculis magnis, orbita interna pallida. Labrum pallidum. Mandibulae nigrae, palpi pallidi, articulo ultimo obscuro, maxillares parvae filiformes, labiales elongato-securiformes; antennae tenues piceae basi rufescente, articulo ultimo magno compresso-ovali, apice acuto paullo curvato. Prothorax elongatus, subcylindricus, piceus, ante medium et prope basin parum constrictus, carina dorsali in parte postica. Elytra elongata, depressa, opaca, fulvo-albida, basi rufo-tincta, breviter sericeo-setosa, singula costis duabus parum elevatis, e basi vix ad medium extensis, utrinque serie punctorum marginalium, maculis duabus rotundatis prope scutellum, fascia tenui dentata ante medium, altera lata submediana, antice tridentata, tertiaque tenui acute dentata ante apicem fuscis, opacis. Pedes alternatim fusco albidoque annulati, unguibus simplicibus. Corpus infra piceo-castaneum, abdomine pallidiori.

22. *THANASIMUS ANTHICOIDES*, Westw. (Pl. XXVII. fig. 8.) (White, Suppl. Cat. Cleridae, p. 59.) *Niger, nitidus, elytris purpureo-piceis, maculis 4 magnis, subrotundatis, duabus ante medium, alterisque duabus subapicalibus albidis, antennis pallide castaneis, articulis 4 apicalibus nigris*.—Long. corp. lin. 1½.

Hab. in insula Ceylon. In Mus. Templeton.

Parvus, brevis, latus, subdepressus, nitidus, capite et prothorace leviter punctatis; elytris vix striato-punctatis. Caput latum convexum. Antennae elongatae, articulis 4 apicalibus sensim incrassatis, ultimo ovali apice acuto, articulis basalibus flavescens, intermedii castaneis, apicalibus nigris. Palpi lutescentes, maxillares breves, filiformes, labiales elongato-securiformes. Prothorax brevis, cyaneo-niger, latus, lateribus rotundatis, ante medium impressione curvata, alteraque prope basin. Elytra lata, subdepressa, lateribus in medio parum latioribus, nitida, ad humeros subangulata, sutura parum elevata, punctata punctis vix strias regulares formantibus et ante apicem desinentibus, maculis duabus subrotundatis, transversis,

ante medium, alterisque duabus subovalibus, subapicalibus, albidis. Pedes elongati, satis robusti, picei, tibiis posticis longe setosis, geniculis tarsisque castaneis, tarsis posticis articulo 2do longo compresso, unguibus simplicibus.

23. CLERUS (OMADIUS) MEDIOFASCIATUS, Westw. (Pl. XXVI. fig. 1.) *Niger, luteo-sericans, elytris fulvo-cinereis, fascia lata submedia, punctis 4 ante medium, alterisque duabus parvis subapicalibus nigris.*—Long. corp. lin. $5\frac{1}{2}$.

Hab. in India Orientali, Khasyah Hills. In Mus. Hope.

Elongatus, subcylindricus, haud nitidus. Caput parvum, oculis magnis antice fere conjunctis, setis luteis sericans. Antennae breves piceae, articulis 5–10 sensim majoribus, intus angulato-serratis setosis, ultimo magno ovali compresso apice acuto. Palpi maxillares picei, filiformes; labiales longi, articulo ultimo mediocriter securiformi, lutescentes, apice picei. Prothorax elongatus lateribus fere rectis; postice sensim paullo angustior, antice transversim rugulosus, in medio rugosus, carina media angusta longitudinali polita, ante medium, et fere ad basin transversim impressus. Elytra obscure cervina, setis auratis brevibus dense obsita, dimidio basali vix distincte punctato-striato, macula parva humerali, alterisque duabus ante medium, lateribusque singuli nigricantibus, fascia lata submedia punctisque duobus subapicalibus nigris. Pedes nigri femoribus posticis basi fulvescentibus; ungues longi acuti, basi in dentem obtusum dilatato. Corpus subtus fulvo-castaneum, prosterno nigro.

24. CLERUS (OMADIUS) OLIVACEUS, Westw. (Pl. XXVI. fig. 3.) *Gracilis, pallide fuscus, setis aureo-olivaceis sericans, oculis magnis nigris, elytris maculis duabus indeterminatis ante medium, fascia dentata pone medium, alteraque subapicali, fuscis; pedibus lutescentibus fusco variis.*—Long. corp. lin. $3\frac{3}{4}$.

Hab. Prince of Wales Island (D. Cantor). In Mus. Hope.

Parvus, elongatus, praecedentis forma; punctis minutis distantibus impressus. Caput convexum sericans, antennae pallide castaneae, basi flavescens, articulis apicalibus latis fuscis. Palpi fulvescentes, labiales elongato-securiformes. Prothorax subcylindricus, postice parum angustatus, sericans, ante medium constrictus et transverse impressus, basique linea impressa. Elytra sericantia dimidiatim punctato-striata, macula indeterminata ante medium singuli; fascia pone medium dentata, alteraque, subapicali, fuscis. Pedes pallide lutescentes, femoribus in medio, tibiisque basi et in medio tarsisque fuscis. Corpus infra castaneum.

25. THANASIMUS SUBSCUTELLARIS, Westw. (Pl. XXV. fig. 6.) *Niger, opacus, setosus, elytris macula parva transversa scutellum includente laete fulva, striga transversa ante medium fere obsoleta, fascia recta pone medium, apiceque griseis.*—Long. corp. lin. $3\frac{1}{4}$.

Hab. in India Orientali. In Mus. Parry.

Depressus, niger opacus, setosus. Caput vix prothoracis latitudine, convexum, transversum. Mandibulae, palpi et antennae nigrae,

palpi maxillares filiformes breves, labiales securiformes. Antennæ graciles articulis 6-11 sensim crassioribus. Prothorax brevis lateribus rotundatis, ante medium et ad basin transverse impressus. Elytra oblonga in medio vix latiora, opaca, nigro-setosa, e basi ultra medium punctato-striata, macula parva transversa (scutellum includente) fulva; setis nonnullis griseis strigam simulantibus ante medium, fascia transversa recta pone medium, apiceque ipso griseis. Pedes longi, nigri, coxis posticis pallidis, unguibus acutis longis, basi in dentem obtusum dilatato. Corpus infra nigrum, metasterno rufo-castaneo abdomineque fulvo.

26. CLERUS (STIGMATIUS) RUFIVENTRIS, Westw. (White, App. Cat. Cleridæ, p. 52.) (Pl. XXVI. fig. 5.) *Brevis, niger, valde setosus, capite et pronoto sub lente punctatissimis, elytris ad basin scabrosis, punctato-striatis, fascia irregulari ante, altera pone medium, apiceque ipso albido-setosis; antennis gracilibus; metasterno abdomineque testaceis.*—Long. corp. lin. 4.

Hab. Assam (D. Jenkins). In Mus. Westwood.

Caput et pronotum sub lente punctatissima. Caput breve latum, oculis magnis, antice cinereo-setosum. Mandibulæ nigræ; palpi picei, maxillares subfiliformes, labiales elongato-securiformes. Antennæ elongatæ articulis apicalibus vix incrassatis. Prothorax niger, lateribus rotundatis ante medium impressione curvata alteraque basi proxima. Elytra brevia depressa nigra, basi ad costam purpureo-castanea, valde rugosa seu granulosa et punctato-striata, punctis longe ante apicem obsoletis, fascia angusta irregulari ante medium, altera dentata pone medium, apiceque albido-setosis. Pedes piceo-nigri valde setosi, unguibus tarsorum longis acutis, basi intus in dentem obtusum dilatatis. Metasternum et abdomen testacea.

27. CLERUS (STIGMATIUS) ELAPHROIDES, Westw. (White, App. Cat. Cleridæ, p. 54.) (Pl. XXVI. fig. 6.) *Fuscus, aureo-sericans, nigro setosus; antennis gracillimis, pronoto postice bimaculato, elytris e basi ad medium punctato-striatis; pone medium fasciis duabus valde irregularibus piceis.*—Long. corp. lin. 3.

Hab. in insula Ceylon. In Mus. D. Templeton.

Brevis, capite et prothorace fere æqualibus, elytris medio latioribus, postice sensim attenuatis, supra totus setulis aureis sericans, setisque nigris e punctis distinctis emissis. Caput breve convexum. Palpi albidii, labiales elongati securiformes. Antennæ longæ gracillimæ, longe setosæ, articulis longitudine fere æqualibus apicalibus vix crassioribus, basi subtus flavescens, reliquis articulis fuscis apice pallidis. Prothorax brevis latus lateribus rotundatis, ante medium et ad basin transversim impressus, disco postico maculis duabus oblongis fuscis. Elytra elongata, in medio latiora, postice sensim attenuata, aureo-sericantia, e basi longe ultra medium striato-punctata, nigroque setosa; fasciis duabus fuscis valde irregularibus inter medium et apicem. Pedes albido-fulvescentes longe setosi, femoribus basi late albidis, et ante apicem fascia fusca, tibiis basi obscurioribus. Corpus infra castaneum nitidum lateribus nigrum.

28. *OPETIOPALPUS OBESUS*, Westw. (Pl. XXVII. fig. 11.) (White, App. Cat. Cleridæ, p. 63.) *Parvus, crassus, convexus, subnitidus, punctatus, nigro-setosus; capite et pronoto obscure sanguineis, elytris nigris immaculatis, antennis pedibusque fulvis, illarum clava picea.*—Long. corp. lin. 1½.

Hab. in India Orientali (*D. Hearsey*). In Mus. Westwood.

Caput obscure sanguineum, punctatum, medio faciei inter antennas læve. Antennæ fulvæ fere pronoti longitudine, articulis tribus ultimis crassis piceis. Palpi fulvi; maxillares articulo ultimo longo acutissimo fusco, labiales articulo ultimo ovali, apice truncato. Prothorax integer, punctatus, convexus lateribus rotundatis, capite latior. Elytra brevia, convexa, subovalia, nigra, profunde punctata, punctis versus basin strias vix regulares formantibus, apicibus lævioribus. Pedes breves fulvi, unguibus simplicibus. Corpus infra piceum, griseo-setosum.

C. AUSTRALIAN SPECIES.

29. *CLERUS (XYLOTRETUS) EXCAVATUS*, Westw. (Pl. XXIV. fig. 10.) *Niger, punctatissimus, subopacus, guttis duabus ante oculos, maculis lateralibus pronoti scutelloque albo-setosis, elytrorum disco excavato-punctato, antennarum articulo apicali profunde emarginato.*—Long. corp. lin. 7.

Hab. in Australia Occidentali. In Mus. Hope.

Caput nigrum, convexus, punctatum, postice subcupreum, emarginatura antica oculorum albo setosa, facie antice elongata, griseo-setosa. Mandibulæ, palpi et antennæ nigræ, palpi maxillares medio-criter elongato-filiformes, labiales articulo ultimo triangulari. Antennæ articulis 6 ultimis sensim latioribus, ultimo interne producto, apice emarginato. Prothorax capite latior, punctatissimus, versus basin paullo constrictus, utrinque necnon ad angulos laterales posticos, setis albis ornatus. Scutellum rotundatum, album. Elytra e humeris ad apicem sensim angustata, nigra opaca punctatissima, punctis medii disci magnis, profundis et valde contiguis, apex minus punctatus, subnitidus, podex niger stria media alba. Pedes purpureo-nigri, femoribus versus basin tibiisque albo setosis: corpus infra nigrum, metasterni lateribus, abdominis basi et lateribus, albo maculatis.

30. *TILLUS DUX*, Westw. (Pl. XXIV. fig. 11.) *Magnus, elongatus, cylindricus, fusco-nigricans, setosus, pubescentia aurea obsitus, antennarum articulis 6 ultimis sensim latioribus serratis, unguibus tarsorum bifidis.*—Long. corp. lin. 13½.

Hab. in Nova Hollandia apud Fluvium Cygnorum. In Mus. Melly.

Caput prothorace paullo latius, breve. Antennæ mediocres, articulis 5–10 sensim latioribus, intus angulatis, serratis, ultimo ovali apice subacuto et curvato. Palpi maxillares parum, labiales valde securiformes. Prothorax elongatus, subcylindricus, elytris multo angustior, antice parum latior, ante et pone medium paullo constrictus. Elytra elongata, subcylindrica, punctata, nubila seu fascia

indistincta ante medium obscura. Pedes mediocres, concolores, unguibus tarsorum bifidis.

Obs. Generi *Tillo* congruit antennarum articulis 6 apicalibus dilatatis, unguibusque tarsorum denticulatis; *Opilo* vero palpis maxillaribus, subsecuriformibus.

31. CLERUS (LEMIDIUS) FESTIVUS, Hope MS. (Pl. XXV. fig. 3.)
Nigro-cyaneus, nitidus, rugose punctatus, pronoto, striola tenui humerali fasciaeque transversa media elytrorum late rubris.—Long. corp. lin. 2½.

Hab. in Australia Occidentali. In Mus. Hope.

Caput breve, transversum, facie concava (clypei margine elevato), subrugosa, linea media parum elevata; vertice in medio lævi. Antennæ breves, tenues, brunneæ, articulis tribus apicalibus dilatatis. Palpi maxillares parvi, filiformes, brunnei, labiales elongato-securiformes, obscure lutei. Prothorax lateribus convexus, prope marginem anticum et posticum transversim impressus, dorso fere lævi nitido, utrinque impressione parva ovali. Scutellum triangulare, nigrum. Elytra elongata, pone medium latiora, nigro-setosa, rugoso-punctata; stria tenui transversa, humerali, fasciaeque lata media transversa, læte rufis. Pedes nigri, femoribus 4 anticis subtus, geniculis tarsisque piceis. Corpus infra nigrum, nitidum, abdomine rufo, apice cyaneo-nigro.

32. CLERUS (LEMIDIUS) CORALLIPENNIS, Westw. (*Clerus? hilaris*, Newm. Zool. p. cxix, nec Westw. in White, App. Cat. Cleridæ, p. 48.) (Pl. XXV. fig. 2.) *Cyaneo-niger, nitidus, parum punctatus, depressus, elytris corallinis, fascia latissima, purpurea, apiceque tenuissime nigro, metasterno abdomineque testaceis.*—Long. corp. lin. 2¾.

Hab. Hunter's River, Australia? New Zealand? In Mus. Parry.

Niger, nitidus, parce punctatus, longe nigro-setosus, pronoto cyaneo parum tincto. Caput prothorace parum latius, oculis magnis, facie inter oculos impressionibus duabus rotundatis punctatis. Antennæ breves, articulis tribus apicalibus majoribus. Palpi nigri, maxillares breves, subfiliformes, labiales late securiformes. Prothorax elytris angustior, lateribus in medio valde rotundatis, parte antica et postica angustis. Scutellum parvum, nigrum. Elytra lata, pone medium paullo dilatata, lævia, nitida, corallina, fascia latissima marginibus rectis, purpurea, apiceque nigro marginato. Pedes nigri, longe setosi, unguibus tarsorum simplicibus, metasternum et abdomen infra rufo-testacea, nitida.

33. CLERUS (HYDNOCERUS) BELLUS, Westw. (Pl. XXVII. fig. 2.) *Elongatus, niger nitidus, capite et pronoto lævibus, illo nigro facie flavida, hoc fulvo, elytris rude punctato-striatis, striola transversa humerali, cum macula magna, communi, rotunda, connexa, fasciaeque submedia, albido-carnea, pedibus anticis flavescentibus, posticis nigris.*—Long. corp. lin. 3.

Hab. apud Adelaidam, Australasiæ (*D. Fortnum*). In Mus. Hope. *Elongatus*, elytris parallelis, griseo-setosus. Caput læve nigrum,

facie cum ore et antennis flavidis. Antennæ breves, articulis tribus apicalibus incrassatis. Mandibulæ apice picæ. Palpi maxillares minuti, filiformes, labiales longe securiformes. Prothorax longior quam latus, lævis, fulvus, ante et pone medium constrictus, lateribus in medio rotundatis, nigris. Scutellum rotundatum, nigrum. Elytra longa, capite vix latiora, subdepressa, nitida, rude punctato-striata, striis ad apicem fasciæ submediæ extensis, singula striola transversa humerali, macula magna, rotundata, communi basali connexa, fasciæque submediana, albido-carnea, tertia parte apicali subrugosa, apicibus rotundatis. Pedes antici pallide flavescences, intermedii femoribus in medio tibiisque, linea supra fuscis, postici nigri coxis geniculisque flavescensibus.

34. CLERUS (HYDROCERUS) EXILIS, Westw. (Pl. XXVII. fig. 4.)
Subelongatus, niger nitidus, facie antennisque flavis, pronoto (margine antico excepto) fulvo, strigaeque transversa humerali elytrorum flava, pedibus anticis flavis, posticis piceis.—Long. corp. lin. 2.

Hab. apud Adelaidam Novæ Hollandiæ. In Mus. Hope.

Præcedenti brevior, elytrisque pone medium paullo latioribus. Caput breve, nigrum, læve nitidum, facie, ore et antennis flavis; antennæ breves articulis tribus ultimis latioribus. Palpi maxillares parvi, cylindrici, labiales longe securiformes. Caput infra flavum jugulo nigro. Prothorax lævis, nitidus, fulvus, margine antico nigro, lateribus in medio rotundatis; ante medium et ad basin subconstrictus. Elytra nitida irregulariter punctata, nigra, striola humerali transversa flava. Corpus infra nigrum nitidum. Pedes 4 antici, femoribusque posticis basi flavis, pedibus posticis piceis.

35. CLERUS (HYDROCERUS) V-REVERSUS, Westw. (Pl. XXVII. fig. 5.) *Subelongatus, niger nitidus, antennis pedibusque piceis, elytrorum singulo striola humerali transversa, striaque obliqua submedia, albis.*—Long. corp. lin. 1½.

Hab. apud Adelaidam Novæ Hollandiæ (D. Fortnum). In Mus. Hope.

Præcedenti proximus, niger nitidus, parce griseo-setosus. Caput prothorace paullo latius, facie punctata, os cum palpis et antennis piceis. Pronotum nigrum nitidum, lateribus subrotundatis parum rugosis, prope marginem anticum, et ante basin striola transversa impressum. Elytra pone medium parum latiora, nigra, rude punctata, singulo striola basali transversa, ad scutellum parum dilatata, fasciæque obliqua e medio lateris versus basin suturæ extensa, alba. Corpus infra nigrum, pedibus 4 anticis piceis, femoribus pedibusque posticis nigricantibus.

36. CLERUS (HYDROCERUS?) FLAVO-LINEATUS, Westw. (White, App. Cat. Cleridæ, p. 62.) (Pl. XXVII. fig. 1.) *Chalybeo-niger, dense griseo-setosus, facie labroque flavidis; antennis subfiliformibus luteis; elytris valde elongatis, punctatis, disco singuli striga longitudinali pallide flava notato, pedibus sub-fulvis, femoribus supra nigris.*—Long. corp. lin. 2.

Hab. in Australia meridionali. In Mus. Westwood.

Caput prothorace paullo latius, sparsim punctatum, facie, labro, ore et basi antennarum pallide flavis. Antennæ brevissimæ, serratæ, articulis apicalibus vix præcedentibus latioribus, fulvescentibus. Palpi flavescentes; maxillares breves filiformes; labiales latissime securiformes. Pronotum subdepressum, sparsim punctatum, lateribus parum rotundatis, striola transversa impressa prope marginem anticum, impressione nulla postica. Elytra valde elongata, punctata, subparallela, singuli disco toto humerisque flavidis. Corpus infra nigrum, lateribus abdominis margineque postico segmentorum abdominalium flavidis. Pedes 4 antici subfulvi, femoribus supra nigris, femoribus posticis nigris, tibiæ apice, tarsisque piceis, unguibus acutis, basi subtus in dentem latum producto.

37. CLERUS (HYDNOCERUS?) FLAVO-VARIUS, Westw. (White, App. Cat. Cleridæ, p. 62.) (Pl. XXVII. fig. 3.) *Piceo-niger, facie, antennis subfiliformibus, ore palpisque flavis, pronoto flavo, ferreo-equino piceo dorsali notato; elytris nigris, maculis 8 flavis notatis*.—Long. corp. lin. 2½.

Hab. King George's Sound. In Mus. Westwood.

Præcedenti proximus, et antennis et prothorace similiter formatis; longe griseo-setosus. Caput vertice nigro sparsim punctato, facie, ore, palpis et antennis pallide flavis; mandibulæ apice piceæ. Pronotum flavum, latitudine capitis, lateribus ante medium subrotundatis, postice fere rectis, disco macula ferreum equinum simulante picea notato. Elytra valde elongata, rugose punctata, singula striola humerali transversa cum macula oblonga basali connexa, macula rotundata fere media, alteraque inter medium et apicem, apiceque ipso flavo. Corpus infra nigrum. Pedes flavi, femoribus et tibiis posticis apice, tarsisque nigris.

38. CLERUS (HYDNOCERUS) PECTORALIS, Westw. (White, App. Cat. Cleridæ, p. 61.) (Pl. XXVII. fig. 6.) *Totus pallide fulvus, nitidus, thorace subtus oculisque nigris, elytris grosse punctatis, antennisque clavatis*.—Long. corp. lin. 2½.

Hab. in Australia meridionali. In Mus. Westwood.

Præcedentibus duobus affinis, at brevior, latior et minus parallelus; caput longius, fere læve, facie inter oculos impressionibus binis ovalibus. Palpi maxillares subfiliformes, labiales late securiformes. Antennæ breves articulis tribus apicalibus incrassatis. Prothorax fere lævis, nitidus, lateribus rotundatis prope marginem anticum constrictus, et transversim impressus. Elytra pone medium parum latiora, grosse punctato-striata, punctis versus apicem paullo majoribus. Pedes toti fulvescentes, tarsorum articulis latis, unguibus brevibus basi intus dilatatis.

39. CLERUS NOVEM-GUTTATUS, Westw. (Pl. XXVII. fig. 9.) *Purpureus, punctatissimus, dense nigro-setosus, antennis nigris basi rufescentibus, prothorace postice latiore, scutello maculisque parvis rotundatis 8 elytrorum albo-hirtis*.—Long. corp. lin. 2.

Hab. Nova Hollandia prope Hunter's River. In Mus. Westwood.
No. CCXLI.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

Parvus, elegans, convexus, caput convexum, punctatissimum, antennæ breves, clavatæ articulis 4 apicalibus sensim incrassatis, articulis basalibus rufescentibus. Palpi maxillares cylindrici, breves, labiales articulo ultimo triangulari. Prothorax brevis, punctatissimus, pone medium lateribus rotundatis et capite latoribus, prope marginem posticum transversim impressus. Elytra convexas, pone medium parum latoria, rude punctata, singula macula parva rotundata ante medium disci, 2nda laterali submedia, 3tia pone medium, 4taque subapicali albo-hirtis. Pedes breves, cyanei, unguibus simplicibus.

40. *OPILUS HILARIS*, Westw. (White, App. Cat. Cleridæ, p. 48, *Tillus h.* nec *Tillus h.* Newm.) (Pl. XXVI. fig. 12.) *Elongatus, subcylindricus, nitidus, castaneo-rufus, punctatissimus; antennæ palpisque rufo-fulvis; elytris tertia parte basali testacea, reliqua parte nigra, fascia angusta submedia, recta, alba, punctato-striatis apicibus sublævibus.*—Long. corp. lin. 2.

Hab. in Terra Van Diemenii (*D. Ewing*). In Mus. Westwood.

O. caro, Newm., affinis. Caput punctatissimum, castaneo-rufum; antennæ vix prothoracis longitudine fulvæ, articulis 9 et 10 elongatis, crassioribus, 11mo longiori ovato. Palpi fulvi. Prothorax castaneo-rufus rude punctatus, antice nigricans, subcylindricus, ante marginem posticum angustatus. Elytra cylindrica, rude punctato-striata, striis longe ante apicem oblitteratis, apice lævi nitido, tertia parte basali fulvo colore utrinque oblique terminato, parte relicta nigra, fascia recta angusta transversa, media alba. Corpus subtus cum pedibus nigrum; abdomine nigro.

41. *OPILUS MÆRENS*, Westw. (White, App. Cat. Cleridæ, p. 57, *Notoxus m.*) (Pl. XXVI. fig. 10.) *Niger, punctatissimus, subcylindricus, cinereo-setosus, pedibus antennisque piceis, his basi rufescentibus; elytris punctato-striatis, apicibus lævibus, fascia transversa medio albida.*—Long. corp. lin. 2½.

Hab. apud Adelaidam Novæ Hollandiæ. In Mus. Westwood.

Op. picipenni, Westw. (White, *op. cit.* p. 48) proximus. Caput antice valde convexum, præsertim postice punctatissimum. Palpi picei omnes mediocriter securiformes. Antennæ piceæ, basi rufescentes, articulis tribus ultimis dilatatis. Prothorax cylindricus capitis latitudine, postice parum angustatus, punctatus, in medio disci impressione oblonga parum notatus, marginibus impressionis irregularibus lævibus. Elytra elongata, subcylindrica, e basi paullo pone medium rude punctato-striata, apicibus fere lævibus, fascia transversa recta media alba, sutura tenui nigricante. Corpus infra nigrum, tenue punctatum, nitidum. Pedes nigri, coxis castaneis; tibiis tarsisque piceis.

42. *CLERUS (XYLOTRETUS) CHRYSIDEUS*, Westw. *Elongatus, angustus, punctatissimus, nitidus, depressus, facie linea tenuissima media elevata; antennæ articulo ultimo apice emarginato; prothorace subcylindrico dorso transversim striolato, scutello albo hirtio; elytris rude punctatis; corpore subtus albo setoso.*—Long. corp. lin. 3½.

Hab. King George's Sound, Novæ Hollandiæ. In Mus. Westwood.

Var. α . Totus supra læte igneo-cupreus, capite et pronoto aureo tinctis. Antennæ et palpi fulvescentes; illæ articulis 4 apicalibus sensim latioribus, ultimo apice emarginato. Palpi maxillares cylindrici; labiales mediocriter securiformes. Prothorax elongatus, subcylindricus, capite paullo angustior, ante et pone medium paullo constrictus, scutellum parvum albo setosum. Elytra elongata, depressa, rude punctata. Corpus infra aureo-viride, femora purpurea, tibiæ rufo-castaneæ, tarsi picei.

Var. β . (*Cl. atricornis*, Westw.) Supra totus cupreo-purpurascens, nigro setosus, antennis, palpis, pedibusque nigris, purpurascente tinctis; corpore infra nigro metallice paullo tincto.

Var. γ . (*Cl. æruginosus*, Westw.) Supra totus læte viridis, antennis palpisque fulvis, illorum articulis tribus apicalibus nigris; corpore infra viridi, nitido; pedibus, ut in var. α . coloratis.

43. CLERUS VENTRALIS, Westw. *Niger nitidus, capite opaco, facie plana, labro, antennis, palpis, tibiis tarsisque 4 anticis fulvescentibus, elytris dimidio basali valde rugoso, apicali lævissimo, tuberculis duobus prope scutellum, fascia tenui media transversa, apiceque albo hirtis.*—Long. corp. lin. 4.

Hab. Hunter's River, Nova Hollandia. In Mus. Parry, Westwood.

Caput nigrum, opacum, punctis minutis omnino obiectum. Labrum et antennæ rufescentes, hæ articulis tribus ultimis majoribus, ultimo ovali. Palpi fulvescentes; maxillares filiformes, labiales articulo ultimo triangulari. Prothorax brevis, capite paullo latior, lateribus rotundatis, postice angustior, rugose punctatus, impressione transversa curvata ante medium, alteraque transversa basali. Elytra lata, depressa, angulis humeralibus prominulis, tuberculis duobus basalibus prope scutellum, nigra nitida, dimidio basali valde rugoso, apicali lævissimo nitido, fascia transversa angusta media, apiceque late griseo-albo hirtis. Pedes nigri, tibiæ et tarsi 4 antici castanei. Corpus infra nigro-cyaneum, abdomine purpureo nitidissimo, metathorace utrinque albo hirtio.

44. OPILUS 6-NOTATUS, Westw. (White, App. Cat. Cleridæ, p. 57.) (Pl. XXVI. fig. 7.) *Elongatus, angustus, pedibus valde elongatis, supra cyaneus, elytris rude punctatis, dimidio apicali lævi, maculis duabus ovalibus ante medium, fascia transversa submedia, maculisque duabus subobliquis apicalibus flavidis.*—Long. corp. lin. $3\frac{1}{2}$ – $6\frac{1}{2}$.

Hab. in Terra Van Diemenii (*D. Ewing*). In Mus. Brit. et Westw. Var. *Notoxus pulcher*, White, *op. cit.* p. 58.

Caput cyaneum, punctis minutis subrugosum, latitudine prothoracis. Antennæ elongatæ, fulvæ, articulis tribus ultimis majoribus. Palpi fulvi, omnes securiformes. Labrum fulvum. Prothorax cyaneus lateribus rotundatis, postice angustatus, ante medium impressione angulata, lineaque media longitudinali abbreviata dorsali, alteraque transversa basali impressus. Elytra cyanea, apice magis purpureo, dimidio basali striato-punctato; apicali lævi, maculis duabus parvis ovalibus ante medium, fascia interrupta mediana, maculisque duabus

subobliquis apicalibus flavidis. Corpus infra cyaneum. Pedes nigri, trochanteribus femoribusque basi apiceque tibiarum, tarsisque fulvis.

45. CLERUS SEPULCRALIS, Westw. (Pl. XXV. fig. 9.) *Niger nitidus, griseo-setosus, elytris fascia communi paullo curvata, media alba.*—Long. corp. lin. 4½.

Hab. in Nova Hollandia. In Mus. Parry.

Niger nitidus, capite et pronoto fere lævibus, elytris punctatissimis, punctis vix in lineas longitudinales dispositis, apicibus late lævibus. Caput convexum, nigrum. Labrum pallide fuscum. Antennæ nigrae, articulis tribus ultimis sensim et paullo latioribus. Palpi picei, maxillares breves filiformes, labiales longe securiformes. Prothorax postice angustior, lateribus rotundatis, ante medium impressione curvata alteraque recta prope basin. Elytra elongata, depressa, nigra, nitida, fascia media communi curvata alba. Pedes nigri, griseo-setosi, tarsi picei, unguibus simplicibus. Corpus infra nigrum, abdomine piceo.

46. NECROBIA PINGUIS, Westw. (White, App. Cat. Cleridæ, p. 63.) (Pl. XXVII. fig. 10.) *Brevis, crassa, rufo-castanea, punctatissima, subopaca, capite, antennarum apice, elytrisque nigris; his fascia tenui transversa media, alteraque subapicali albis.*—Long. corp. lin. 3½.

Hab. in Terra Van Diemenii (*D. Hooker*). In Mus. Westwood.

Brevis, crassa, subopaca, punctatissima. Caput parvum, nigrum, punctatissimum. Antennæ nigrae, articulis basalibus rufis, tribus apicalibus dilatatis. Labrum et palpi fulvo-castanei. Prothorax capite multo latior, lateribus in medio utrinque in tuberculum rotundatum dilatatis, punctatissimus; scutellum castaneo-rufum. Elytra nigra, subopaca, grosse punctata, fascia tenui fere recta media, alteraque subapicali albidis. Corpus subtus cum pedibus rufo-testaceum.

47. CLERUS (HOPLOCLERUS) BIACULEATUS, Westw. (White, App. Cat. Cleridæ, p. 61.) (Pl. XXV. fig. 1.) *Læte testaceus, oculis nigris, elytris nitide cyaneis, humeris apicibusque testaceis, his in spinis duabus suturalibus productis, corpore infra testaceo, meso- et metasterno cyaneis.*—Long. corp. lin. 3.

Hab. in Australia meridionali. In Mus. Westwood.

Subdepressus, lævis, nitidus, elytris irregulariter punctatis, postice latioribus. Caput thoracis latitudine, fere læve. Antennæ breves, fulvae, articulis tribus ultimis crassioribus. Palpi fulvi, maxillares filiformes minuti, labiales valde securiformes. Prothorax fulvus, lateribus in medio rotundatis, prope marginem anticum transverse impressus, postice angustatus. Elytra lata, postice latiora, cyanea, punctatissima, humeris angustis apicibusque fulvis, his ad suturam in spinas duas productis. Corpus infra testaceum, meso- et metasterno cyaneis, nitidissimis. Pedes testacei, tarsis 4 posticis, obscuris, unguibus simplicibus.

48. ENOPLIUM PUSTULIFERUM, Westw. (Pl. XXIV. fig. 8.) *Piceum, setosum, subnitidum, parce punctatum; antennis et pronoto luteis, elytrorum disco tuberculis minutis instructo, sin-*

guloque pone medium plaga irregulari obscure albida notato.
—Long. corp. lin. 3.

Hab. in Nova Zealandia. In Mus. Brit.

Elongatum, piceum, subtus nitidum, supra vix nitidum. Caput minutissime punctatum, faciei disco semiovali, nigro, carina tenui marginato. Mandibulae breves, luteae, apice nigrae. Palpi subfulvi, omnes articulo ultimo parvo securiformi. Oculi interne incisi. Antennae dimidio corporis paullo longiores, graciles, luteo-fulvae, articulis tribus apicalibus valde elongatis. Pronotum fulvum, nitidum, vix punctatum, dorso valde irregulari, tuberculis duobus ante, alterisque duobus pone medium minoribus, glabris, lateribus antice fere rectis, medio rotundato-dilatatis, basique constricto. Elytra obscure picea, dorso valde irregulari punctata et pustulosa, tuberculis duobus elevatis prope basin, alterisque duobus ante medium, e praecedentibus canali obliqua separatis, disco singuli pone medium plaga irregulari lutea, tuberculisque duobus magnis ante apicem. Pedes luteo piceoque alternatim variegati.

49. CLERUS (OMADIUS) PRASINUS, Westw. (Pl. XXVI. fig. 2.)

Elongatus, parum depressus, obscure prasinus, aureo-sericans, elytris nigro maculatis, maculis aureo sericanti marginatis, pedibus fulvis, femoribus tibiisque in medio fusco-annulatis.—Long. corp. lin. 6.

Hab. Moreton Bay, Novae Hollandiae. In Mus. Brit. et Westwood.

Caput thoracis latitudine, oculi magni, nigri, in medio faciei approximati, subtus pro receptione antennarum, profunde emarginati. Clypeus setosus, labrum bilobum luteum, palpi maxillares graciles breves apice fusci, labiales elongati articulo ultimo longe securiformi, lutei. Antennae graciles fuscae, articulis duobus basalibus stramineis, articulis 8, 9, 10 obconicis sensim majoribus, 11 magno subovali compresso apice intus subacuto, vertex et pronotum sub lente tenuissime granulata, sericantia, hoc antice et postice constricto, lineaque media longitudinali elevata in parte postica. Elytra elongata, prothorace latiora subparallela, pone medium parum attenuata, longitudinaliter sulcata, sulcis punctatis, basique profundius punctato; maculis irregularibus nigris (singula margine tenui aureo-sericanti) fascias tres formantibus, 1ma ante, 2da paullo pone (valde undulata), 3tia subapicali. Pedes luteo-fulvi, femoribus et tibiis in medio fusco fasciatis, tibiis et tarsis basi etiam fuscis, unguibus ad basin profunde incisis. Corpus infra pallide lutescens.

50. THANASIMUS CURSORIUS, Westw. (Pl. XXV. fig. 5.)

Niger cupreo-fusco parum tinctus, elytris basi nigris plaga magna sanguinea, fascia submedia, dentata pallidius rufa; macula magna ovali nigra in singulo, apiceque aureo sericanti; pedibus castaneis, tarsis fuscis.—Long. corp. lin. $3\frac{1}{2}$.

Hab. Adelaidam Novae Hollandiae (D. Fortnum), sole radianti volans et supra arbores sedens et velocissime cursitans. In Mus. Hope.

Caput nigrum subcupreum, tenuissime punctatum. Clypeus cas-

taneus; mandibulae et palpi maxillares nigri, labiales castanei, elongati, articulo ultimo obconico. Antennae mediocres articulis 5-11 fere aequalibus nigris; praecedentibus castaneis. Prothorax latitudine capitis convexus antice et prope basin constrictus, disco tenuissime punctato longe setoso. Elytra modice elongata, prothorace latiora, parum convexa, scabra et profunde punctato-striata, striis versus apicem minus distinctis; basi nigra macula magna humerali in singulo castanea; fascia submedia antice dentata, postice ad suturam elongata castaneo-rufa, macula magna subovali pone fasciam nigra in singulo apicibusque fusco-luteis aureo-sericantibus. Pedes castanei, tarsi fuscis, unguibus ad basin profunde incisis.

51. *CORYNETES COMPACTUS*, Westw. (Pl. XXVII. fig. 7.)

Castaneus punctatissimus; antennis pedibus et elytris fulvis, his nitidis rude punctatis nigro-bifasciatis.—Long. corp. lin. 2.

Hab. in Nova Hollandia? India Orientali? In Mus. Hope.

Species parva, setosa. Caput vix latitudine prothoracis, castaneum punctatissimum. Oculi minuti, laterales. Antennae fulvae, breves, articulis tribus ultimis majoribus, 11mo multo majori, breve ovali. Palpi breves, fulvi, omnes articulo ultimo securiformi. Prothorax castaneus haud nitidus punctatissimus, lateribus in medio paullo rotundato-dilatatis, ante basin vix constrictus, disco utrinque prope marginem anticum tuberculo parum elevato glabro. Elytra prothorace multo latiora, apice rotundata, disco subconvexo, glabra, rude punctato-striata, punctis paullo pone medium oblitteratis, fulva setosa, fascia recta nigra ante medium, alteraque latiori pone medium, nigris. Pedes breves, fulvi, tarsi anticis articulo basali (praesertim in anticis) minuto, infero; 2ndo et 3tio subtus lobatis, 4to minuto, unguibus integris.

52. *NECROBIA EXIMIA*, White, in Append. Cat. Cleridae, p. 63.

(Pl. XXVII. fig. 12.) *Metallicus, capite et pronoto nigro-viridibus nitidissimis aeneo parum tinctis; antennis palpisque piccis, elytris igneo flavo viridique nitidis fasciaeque media purpurea.*—Long. corp. lin. 2 $\frac{3}{4}$.

Hab. Hunter's River, Australia Occidentali. In Mus. Brit., Parry, et Westwood.

Caput parvum. Antennae rufo-piceae, articulis tribus ultimis magnis nigris, 11mo rotundato, apice acuto. Palpi maxillares articulo ultimo paullo crassiori apice oblique truncato, labiales ultimo articulo distincte securiformi. Prothorax ovalis, antice et postice truncatus, lateribus rotundatis, impressione curvata parum impressa ante medium. Elytra latissima, tenuissime punctata. Pedes nigro-cyanei, nigro-setosi, tarsi articulo basali 2ndo paullo minori, hoc cum 3tio et 4to aequalibus subtus lobatis. Corpus infra flavo-viride.

Varietatem possideo corpore supra omnino laete aureo-viridi nitidissimo.

Differt haec species e *Necrobiis* genuinis magnitudine articuli 4ti tarsorum. An potius *Cleris* adsociandus?

DESCRIPTION OF THE PLATES.

Obs. The lines at the sides of the different insects indicate their respective lengths, and the adjoining outlines represent the 4-jointed maxillary and 3-jointed labial palpi and the tarsi or tarsal unguis.

PL. XXIV.

- Fig. 1. *Cladiscus longipennis*, *Westw.* No. 10. Himalaya.
- Fig. 2. *Cladiscus Parrianus*, *Westw.* No. 11. India Orientali.
- Fig. 3. *Cladiscus bipectinatus*, *Westw.* No. 12. Malabar.
- Fig. 4. *Clerus (Xylobius) albo-varius*, *Westw.* No. 13. Himalaya.
- Fig. 5. *Tillus (Tillicerus) chalybæus*, *Westw.* No. 15. Tenasserim.
- Fig. 6. *Clerus (Xylobius?) dulcis*, *Westw.* No. 14. Java.
- Fig. 7. *Tillus Afzelii*, *Westw.* No. 7. Sierra Leone.
- Fig. 8. *Enoplium pustuliferum*, *Westw.* No. 48. New Zealand.
- Fig. 9. *Tillus (Macrotelus) uniformis*, *Westw.* No. 5. Gambia.
- Fig. 10. *Clerus (Xylotretus) excavatus*, *Westw.* No. 29. West Australia.
- Fig. 11. *Tillus Dux*, *Westw.* No. 30. Swan River.
- Fig. 12. *Erymanthus horridus*, *Hope, MS.* No. 1. Cape Palmas.

PL. XXV.

- Fig. 1. *Clerus (Hoploclerus) biaculeatus*, *Westw.* No. 47. South Australia.
- Fig. 2. *Clerus (Lemidius) corallipennis*, *Westw.* No. 32. Hunter's River.
- Fig. 3. *Clerus (Lemidius) festivus*, *Hope, MS.* No. 31. West Australia.
- Fig. 4. *Thanasimus irregularis*, *Westw.* No. 9. Cape of Good Hope.
- Fig. 5. *Thanasimus cursorius*, *Westw.* No. 50. Adelaide.
- Fig. 6. *Thanasimus subscutellaris*, *Westw.* No. 25. India orientali.
- Fig. 7. *Clerus sanguinalis*, *Westw.* No. 2. Natal.
- Fig. 8. *Thanasimus sellatus*, *Westw.* No. 18. India Orientali.
- Fig. 9. *Clerus sepulchralis*, *Westw.* No. 45. New Holland.
- Fig. 10. *Clerus subfasciatus*, *Westw.* No. 17. India Orientali.
- Fig. 11. *Clerus Bengala*, *Westw.* No. 16. Bengal.
- Fig. 12. *Clerus posticalis*, *Westw.* No. 19. India Orientali.

PL. XXVI.

- Fig. 1. *Clerus (Omadius) medio-fasciatus*, *Westw.* No. 23. Khasyah Hills.
- Fig. 2. *Clerus (Omadius) prasinus*, *Westw.* No. 49. Moreton Bay, New Holland.
- Fig. 3. *Clerus (Omadius) olivaceus*, *Westw.* No. 24. Prince of Wales Island.
- Fig. 4. *Clerus (Stigmatius) nebulifer*, *Westw.* No. 3. Natal.
- Fig. 5. *Clerus (Stigmatius) rufiventris*, *Westw.* No. 26. Assam.
- Fig. 6. *Clerus (Stigmatius) Elaphroides*, *Westw.* No. 27. Ceylon.
- Fig. 7. *Opilus 6-notatus*, *Westw.* No. 44. Van Diemen's Land.
- Fig. 8. *Clerus (Stigmatius) dorsiger*, *Westw.* No. 4. Sierra Leone.
- Fig. 9. *Opilus sordidus*, *Westw.* No. 20. India Orientali.
- Fig. 10. *Opilus mœrens*, *Westw.* No. 41. Adelaide.
- Fig. 11. *Clerus zebratus*, *Westw.* No. 21. India Orientali.
- Fig. 12. *Opilus hilaris*, *Westw.* No. 40. Van Diemen's Land.

PL. XXVII.

- Fig. 1. *Clerus (Hydnocerus?) flavo-lineatus*, *Westw.* No. 36. South Australia.
- Fig. 2. *Clerus (Hydnocerus) bellus*, *Westw.* No. 33. Adelaide.
- Fig. 3. *Clerus (Hydnocerus?) flavo-varius*, *Westw.* No. 37. K. George's Sound.
- Fig. 4. *Clerus (Hydnocerus) exilis*, *Westw.* No. 34. Adelaide.
- Fig. 5. *Clerus (Hydnocerus) V-reversus*, *Westw.* No. 35. Adelaide.
- Fig. 6. *Clerus (Hydnocerus) pectoralis*, *Westw.* No. 38. South Australia.
- Fig. 7. *Corynetes compactus*, *Westw.* No. 51. India? or New Holland?
- Fig. 8. *Thanasimus Anthicoides*, *Westw.* No. 22. Ceylon.
- Fig. 9. *Clerus 9-guttatus*, *Westw.* No. 39. Hunter's River.
- Fig. 10. *Necrobia pinguis*, *Westw.* No. 46. Van Diemen's Land.
- Fig. 11. *Opetiopalpus obeus*, *Westw.* No. 28. India Orientali.
- Fig. 12. *Necrobia eximia*, *White.* No. 52. Hunter's River.

Obs. The species numbered 6, 8, 42 and 43 are not figured.

2. DESCRIPTIONS OF SIXTY-SIX NEW LAND SHELLS, FROM
THE COLLECTION OF H. CUMING, ESQ.
BY DR. L. PFEIFFER.

1. VITRINA MILLIGANI, Pfr. *V. testa imperforata, depresso ovata, solidula, lævigata, nitidissima, olivaceo-nigricante; spira convexa; anfractibus 3 rapide crescentibus, penultimo convexo, ultimo depresso-rotundato, subtus latiusculo; apertura per-obliqua, lunato-ovali, intus concolore; peristomate simplice, subinflexo, margine dextro antrorsum dilatato, columellari leviter arcuato.*

Diam. maj. $22\frac{1}{2}$, min. 16, alt. $10\frac{1}{2}$ mill.

Hab. in insula parvula in Macquarie Harbour, Van Diemen's Land (Milligan).

2. VITRINA CASTANEA, Pfr. *V. testa depressa, ambitu ovali, striatula, nitidissima, castanea; spira plana; anfractibus 3 viz convexiusculis, ultimo magno, basi late membranaceo-marginato; apertura parum obliqua, lunari-ovali; peristomate luteo-limbato, margine membranaceo.*

Diam. maj. 9, min. 7, alt. 5 mill.

Hab. in Australia.

3. VITRINA DIMIDIATA, Pfr. *V. testa depressissima, ambitu ovali, tenuissima, subtiliter arcuato-striata, sericina, pallide cornea; spira subplana; anfractibus $2\frac{1}{2}$ subtus apertis, viz membranaceo-marginatis; apertura horizontali, totam testam occupante; peristomate simplice, marginibus regulariter arcuatis.*

Diam. maj. $5\frac{1}{2}$, min. 4, alt. $1\frac{1}{2}$ mill.

Hab. in Nova Seelandia.

4. HELIX OMEGA, Pfr. *H. testa imperforata, depressa, sublævigata, epidermide fulvo-cornea induta; spira viz elevatiuscula, vertice rubella; anfractibus 4 planiusculis, celeriter accrescentibus, ultimo depresso, basi viz convexiore, medio impresso; apertura obliqua, lunato-ovali; peristomate simplice, recto, margine basali levissime arcuato, superne reflexo, in regione umbilicali adnato.*

Diam. maj. $9\frac{1}{2}$, min. 7, alt. 4 mill.

Hab. in Nova Seelandia.

5. HELIX AULICA, Pfr. *H. testa perforata, tenui, radiatim striatula et plerumque superne spiraliter hinc inde leviter sulcata, diaphana, nitida, coloribus varia; spira brevissime elevata, obtuse conoidea; anfractibus $4\frac{1}{2}$ convexiusculis, rapide accrescentibus, ultimo depresso, peripheria obsoletissime angulato, basi convexiore; apertura permagna, obliqua, multo latiore quam alta, truncato-ovali; peristomate simplice, recto, margine supero lente descendente, columellari arcuato, superne breviter reflexo.*

Diam. maj. 48, min. 41, alt. 23 mill.

Hab. in insulis Moluccis.

This species has been generally confounded with *H. vitrina*, L.

6. *HELIX IOTA*, Pfr. *H. testa perforata, subdepressa, tenui, confertim costata, haud nitente, corneo-lutescente, rufo-maculata et reticulata; spira breviter conoidea, acutiuscula; anfractibus 5 convexiusculis, sensim accrescentibus, ultimo non descendente, rotundato; apertura parum obliqua, rotundato-lunari; peristomate simplice, recto, marginibus distantibus, columellari arcuatim ascendente, superne subdilatato, patente.*

Diam. maj. 4, min. 3 $\frac{3}{4}$, alt. 2 $\frac{1}{2}$ mill.

Hab. in Nova Seelandia.

7. *HELIX LAMBDA*, Pfr. *H. testa umbilicata, subconoideo-depressa, tenui, sublævigata, striis spiralibus interdum sculpta, parum nitida, diaphana, fulva, castaneo maculata; spira subconoidea, obtusula; anfractibus 5 convexiusculis, ultimo non descendente, peripheria obsolete angulato, basi convexo; umbilico mediocri, conico; apertura obliqua, lunato-rotundata, intus nitida; peristomate simplice, recto, marginibus conniventibus, columellari superne subdilatato, patente.*

Diam. maj. 13, min. 11, alt. 7 mill.

Hab. in Nova Seelandia.

8. *HELIX EPSILON*, Pfr. *H. testa umbilicata, depressa, tenui, superne oblique et confertim plicata, pallide cornea; spira convexiuscula; anfractibus 3 $\frac{1}{2}$ convexiusculis, ultimo non descendente, basi sublævigato; umbilico angusto, pervio; apertura parum obliqua, rotundato-lunari; peristomate simplice, recto, marginibus conniventibus.*

Diam. maj. 1 $\frac{1}{2}$, min. 1 $\frac{1}{2}$, alt. $\frac{3}{8}$ mill.

Hab. in Nova Seelandia.

9. *HELIX GAMMA*, Pfr. *H. testa umbilicata, depressa, tenuiuscula, confertissime costulato-striata, diaphana, pallide cornea, rufulo-nebulata; spira vix convexiuscula; sutura impressa; anfractibus 5 convexiusculis, lente crescentibus, ultimo non descendente, subtus convexo; umbilico latiusculo, conico; apertura subverticali, rotundato-lunari; peristomate simplice, recto, marginibus subconniventibus, regulariter arcuatis.*

Diam. 3, alt. 1 $\frac{1}{2}$ mill.

Hab. in Nova Seelandia.

10. *HELIX ETA*, Pfr. *H. testa umbilicata, depressa, subtiliter costulato-striata, sericea, cerea; spira planiuscula; sutura impressa; anfractibus 4 vix convexiusculis, ultimo latiore, non descendente, depresso; umbilico latiusculo, perspectivo; apertura parum obliqua, lunato-subcirculari; peristomate simplice, recto, marginibus conniventibus.*

Diam. 3, alt. 1 $\frac{1}{2}$ mill.

Hab. in Nova Seelandia.

11. **HELIX ZETA**, Pfr. *H. testa latissime umbilicata, depressa, subdiscoidea, solidiuscula, subconfertim valide plicata, non nitente, pallide flavescente, maculis magnis castaneis tessellata; spira plana, medio subimmersa; sutura profunda; anfractibus 5½ angustissimis, convexis, turgidulis, ultimo descendente, tereiusculo, subtus plicis subtilioribus munito; apertura parum obliqua, parvula, lunato-circulari; peristomate simplice, recto, marginibus conniventibus.*

Diam. 3½, alt. 1½ mill.

Hab. in Nova Seelandia.

12. **HELIX ALPHA**, Pfr. *H. testa umbilicata, conica, carinata, oblique striatula et distanter lamellato-costata, strigis brunneis et luteis variegata; spira convexiusculo-conica, apice obtusula; anfractibus 5½ vix convexiusculis, ultimo non descendente, acute dentato-carinato, basi plano, ad umbilicum medio-crem pervium subangulato; apertura diagonali, subsecuriformi; peristomate simplice, recto, margine supero brevi, basali arcuato, ad columellam subverticaliter ascendente.*

Diam. maj. 4½, min. 4, alt. 3 mill.

Hab. in Nova Seelandia.

13. **HELIX BETA**, Pfr. *H. testa umbilicata, trochiformi, carinata, tenui, arcuatim valide plicata, fulva, castaneo late maculata; spira elevata, convexo-conica, acutiuscula; sutura marginata; anfractibus 7 angustis, planiusculis, ultimo subrecedente, non descendente, ad carinam ciliato, basi vix convexiusculo; umbilico angusto; apertura obliqua, angulato-lunari; peristomate simplice, recto, margine basali regulariter arcuato.*

Diam. et alt. 3½ mill.

Hab. —?

14. **HELIX KAPPA**, Pfr. *H. testa umbilicata, depressa, confertim capillaceo-costata, non nitida, cornea, rufo obsolete variegata; spira brevissima, convexiuscula; sutura impressa; anfractibus 5 convexiusculis, sensim accrescentibus, ultimo non descendente, rotundato; umbilico angusto, pervio; apertura verticali, depressa, lunari; peristomate subsimplice, marginibus remotis, dextro recto, basali breviter reflexo, columellari oblique ascendente.*

Diam. maj. 5½, min. 5, alt. 3 mill.

Hab. in Nova Seelandia.

15. **BULIMUS CARDINALIS**, Pfr. *B. testa subperforata, ovata, solida, præter strias incrementi lineis impressis confertissimis longitudinalibus, spiralibus et obliquis sculpta, olivaceo-castanea, nitida, lineis undulatis rufis superne, maculisque nigricantibus sparsis ornata; spira inflato-conica, obtusula; anfractibus 4 convexis, ultimo 4 longitudinis æquante, inflato, basi subcompresso; columella fere verticali, superne subplicata; apertura parum obliqua, ovali; peristomate lilaceo, margini-*

bus callo crassiusculo junctis, dextro expanso-reflexo, columellari dilatato-patente.

Long. 50, diam. 28 mill.

Hab. Quito.

16. *BULIMUS AULACOSTYLUS*, Pfr. *B. testa umbilicata, acuminato-ovata, tenuiuscula, subtiliter striata et submalleata, vix nitente, quasi pruinosa, diaphana, rufa vel fulva, maculis castaneis irregulariter aspersa; spira brevi, convexo-conica, acutiuscula; anfractibus 5 parum convexis, ultimo $\frac{3}{4}$ longitudinis subæquante, basi rotundato; columella compresso-plicata, sulco profundo, arcuatim ascendente ab anfractu penultimo sejuncta; apertura parum obliqua, oblongo-ovali, intus margaritacea; peristomate fusco-purpureo, undique breviter expanso, reflexiusculo, margine dextro levissime arcuato, columellari dilatato, patente.*

Long. 37, diam. 18 mill.

Hab. in insula St. Lucia Indiæ occidentalis (Hartwig).

17. *BULIMUS PERVARIABILIS*, Pfr. *B. testa umbilicata, ovato-conica, tenuiuscula, subtilissime decussatula, lutescenti-albida, plerumque fasciis 5 subinterruptis ornata; spira conica, acuta; anfractibus $6\frac{1}{2}$ vix convexiusculis, ultimo spiram paulo superante, basi subinflato; columella leviter arcuata; apertura vix obliqua, ovali-oblonga; peristomate simplice, albo vel lutescente, expanso, margine columellari fornicatim dilatato, patente.*

Long. 33, diam. $14\frac{1}{2}$ mill.

β. *Gracilior, rubellus, fusco-substrigatus, B. roseato Reeve similis, sed late umbilicatus.*

Hab. in Columbia.

18. *BULIMUS MERCURIUS*, Pfr. *B. testa perforata, ovato-conica, solida, nitida (sub lente minutissime decussatula), fulvido-alba, fasciis latis castaneis ornata; spira turrito-conica, acutiuscula; anfractibus $6\frac{1}{2}$ vix convexiusculis, ultimo $\frac{3}{4}$ longitudinis subæquante, basi rotundato; columella substricta; apertura parum obliqua, truncato-ovali; peristomate simplice, breviter expanso, margine columellari fornicato-reflexo.*

Long. 36, diam. 18 mill.

Hab. — ?

19. *BULIMUS LOXOSTOMUS*, Pfr. *B. testa imperforata, oblonga, solida, irregulariter striata et confertim malleata, sub epidermide virenti-castanea fulva, rufo undulatim strigata et maculata; spira convexo-conica, obtusiuscula; sutura submarginata; anfractibus $5\frac{1}{2}$ convexiusculis, ultimo spira paulo brevior; columella arcuata, superne subplicata, pallide aurantiaca; apertura obliqua, ovali; peristomate recto, incrassato.*

Long. 71, diam. 34 mill.

Hab. in Andibus Novæ Granadæ.

20. *BULIMUS ACUS*, Pfr. *B. testa minima, subimperfectorata, aciculari, sub lente plicato-striata, hyalina; spira subulata, apice obtusiuscula; anfractibus 7-8 convexis, ultimo $\frac{1}{4}$ longitudinis non æquante, basi rotundato; columella subplicata; apertura parum obliqua, oblonga; peristomate simplice, recto, margine columellari brevissime reflexo.*

Long. $3\frac{1}{2}$, diam. $\frac{1}{2}$ mill.

Hab. prope Sevilla Hispaniæ.

21. *BULIMUS PLANOSPIRUS*, Pfr. *B. testa imperforata, turrita, solida, confertim ruguloso-striata, lineis impressis obsolete decussatula, sub epidermide decidua, fulvescente, alabastrino-albida; spira elongata, apice in conum obtusulum terminata; sutura impressa; anfractibus 13 subplanis, ultimo $\frac{1}{2}$ longitudinis subæquante, infra medium obsolete angulato; columella strictiuscula, callosa; apertura obliqua, truncato-oblonga; peristomate simplice, recto.*

Long. 84, diam. 17 mill.

Hab. — ?

22. *BULIMUS SUBFASCIATUS*, Pfr. *B. testa subperforata, oblongo-ovata, solidula, longitudinaliter rugoso-striata et irregulariter decussato-granulata, fulvida, fasciis 2-3 fuscis obsolete cincta; spira convexo-conica, apice obtusa; anfractibus 6 convexiusculis, ultimo spiram æquante, basi rotundato; columella verticali; apertura subverticali, oblonga, intus alba, nitida; peristomate recto, subincrassato, margine dextro superne repando, columellari superne dilatato, albo, reflexo, fere adnato.*

Long. 32, diam. 14 mill.

Hab. in monte Anthisana reipublicæ Æquatoris (Bourcier).

23. *BULIMUS NUCULA*, Pfr. *B. testa anguste umbilicata, ovato-conica, solidiuscula, subtilissime ruguloso-striata, fusco-carnea, plerumque pallide uni-cingulata; spira convexo-conica, acuta; anfractibus $6\frac{1}{2}$ vix convexiusculis, ultimo spira paulo brevior, basi compressiusculo; columella stricta, basi oblique subtruncata; apertura parum obliqua, subsemiovali, basi angulata; peristomate simplice, recto, margine dextro superne perarcuato, columellari reflexo, patente.*

Long. $11\frac{1}{2}$, diam. 6 mill.

Hab. in insulis Gallapagos.

24. *BULIMUS HEBRAICUS*, Pfr. *B. testa rimato-perforata, oblongo-turrita, solida, nitidula, carnea, strigis saturatioribus picta; spira elongata, acutiuscula; anfractibus 7 planiusculis, supremis subtilissime pliculato-striatis, maculis corneis irregularibus inscriptis, ultimo $\frac{1}{2}$ longitudinis subæquante, basi rotundato; columella vix plicata, parum recedente; apertura parum obliqua, ovali; peristomate recto, intus labiato, margine columellari dilatato, plano, patente.*

Long. 29, diam. $12\frac{1}{2}$ mill.

Hab. — ?

25. *BULIMUS BARBADENSIS*, Pfr. *B. testa subperforata, ovato-conica, solidiuscula, ruguloso-striata et obsolete granulata, fusco-cornea; spira conica, acutiuscula; anfractibus 6 viz convexiusculis, ultimo ventrosiore, spiram subæquante; columella viz arcuata; apertura parum obliqua, oblonga; peristomate simplice, recto, margine columellari sursum dilatato, reflexo, subappresso.*

Long. 21, diam. 10 mill.

Hab. in insula Barbados.

26. *CYCLOSTOMA PLICOSUM (OMPHALOTROPIS)*, Pfr. *C. testa perforata, ovato-conica, tenui, longitudinaliter confertim plicata, sericea, rubello-cornea; spira conica, acuta; anfractibus 5 convexiusculis, ad suturam crenulatis, ultimo spiram subæquante, rotundato, circa perforationem angustam compresse subcarinato; apertura viz obliqua, ovali; peristomate simplice, recto, marginibus approximatis, columellari reflexiusculo.*

Long. 6, diam. 4 mill.

Hab. — ?

27. *CYCLOSTOMA? PATERA*, Pfr. *C. testa latissime umbilicata, solidula, discoidea, liris latis granulatis, interpositis linearibus sculpta, epidermide olivaceo-fusca obducta; spira plana; sutura subcanaliculata; anfractibus 4½ planulatis, ultimo medio carina filiformi munito, basi convexo, circa umbilicum pateræformem subangulato; apertura verticali, subangulato-rotundata; peristomate simplice, recto, marginibus approximatis.*

Diam. maj. 10, min. 8, alt. 2½ mill.—Operculum ?

Hab. — ?

Solarii quasi faciem offert; an revera Cyclostomaceis adnumerandum ?

28. *CYCLOSTOMA QUITENSE (CYCLOTUS)*, Pfr. *C. testa umbilicata, depressa, solida, superne striatula, nitida, saturate castanea; spira brevi, conoideo-elevata; sutura profunda; anfractibus 4½ convexis, rapide accrescentibus, ultimo ad suturam depresso, rugato, peripheria cingulo angusto lutescente et fascia lata nigricante ornato, basi fusco-virente, circa umbilicum infundibuliformem confertim radiato-plicato; apertura parum obliqua, irregulariter ovali, dextrorsum producta, intus lirescente; peristomate recto, subincrassato, continuo, marginibus superne angulatum junctis, sinistro ad anfractum penultimum breviter appresso.*

Diam. maj. 37, min. 27, alt. 15 mill.—Operculum Cycloti.

Hab. Quito.

29. *CYCLOSTOMA APPENDICULATUM (CYCLOPHORUS)*, Pfr. *C. testa umbilicata, depressa, solida, lineis spiralibus elevatis, confertis (4–5 paulo majoribus) sculpta, albida, fusculo-marmorata, prope suturam canaliculatam maculis magnis, subquadrangularibus, castaneis et supra peripheriam subcurinatum, castaneo-articulatam fascia pallida signata; spira brevissime conoidea, apice cornea, obtusula; anfractibus 4½ rapide accrescentibus, ultimo ad suturam*

late depresso; umbilico magno, perspectivo; apertura obliqua, circulari; peristomate continuo, breviter adnato, albo, undique aequaliter expanso, margine sinistro in appendicem linguiformem, patentem dilatato.

Diam. maj. 34, min. 27, alt. 15 mill.

Hab. in insulis Philippinis.

30. *CYCLOSTOMA IBYATENSE* (CYCLOPHORUS), Pfr. *C. testa umbilicata, turbinato-depressa, solida, laevigata, subtiliter striatula, nitida, castanea, albido maculata et fasciata; spira turbinata, vertice acutiusculo, corneo; anfractibus 5 modice convexis, ultimo ad suturam subdepresso, maculis magnis subquadratis vel triangularibus albis picto, periphæria obsoletissime angulato, circa umbilicum mediocrem, infundibuliformem albo; apertura parum obliqua, subcirculari; peristomate subincrassato, expansiusculo, marginibus approximatis, callo continuo junctis.*

Diam. maj. 23, min. 18, alt. 14 mill.

Hab. in insula Ibyat "Bashee group."

31. *CYCLOSTOMA AMÆNUM* (CYCLOPHORUS), Pfr. *C. testa umbilicata, depresso-turbinata, solida, laevigata, alba, lineis castaneo-fulvis crebris, maculis sagittiformibus interruptis amœnissime picta; spira conoidea, obtusa; anfractibus 4½ modice convexis, ultimo superne turgido, periphæria carina subcompressa et infra eam fascia saturatiore signato, basi convexo, circa umbilicum angustum, infundibuliformem albo; apertura parum obliqua, subcirculari; peristomate duplici, interno continuo, stricto, porrecto, externo crasso, patente, ad anfractum penultimum vix exciso.*

Diam. maj. 30, min. 24, alt. 18 mill.

Hab. —?

32. *CYCLOSTOMA PICTURATUM* (CYCLOPHORUS), Pfr. *C. testa umbilicata, turbinato-depressa, solida, sublaevigata, albida, strigis et flammis reticulatis castaneis picta; spira breviter conoidea, obtusa; anfractibus 4½ modice convexis, ultimo superne costis nonnullis obtusis spiraliter munito, infra periphæriam rotundatam fascia serrata ornato, circa umbilicum mediocrem, profundum albo; apertura parum obliqua, subcirculari; peristomate subsimplice, crasso, longe protracto, continuo, breviter adnato, margine sinistro dilatato, patente.*

Diam. maj. 29, min. 23, alt. 16 mill.

Hab. —?

33. *CYCLOSTOMA DENSELINEATUM* (CYCLOPHORUS), Pfr. *C. testa umbilicata, globoso-turbinata, solida, lineis spiralibus impressis et obliquis minutissime decussata, vix nitidula, pallide fulva, maculis et fasciis interruptis fuscis picta; spira turbinata, sursum nigricante, apice acuta; anfractibus 5, parum convexis, ultimo superne convexiore, infra medium obtuse carinato, basi planiusculo, circa umbilicum angustum, pervium pal-*

lido; apertura parum obliqua, subcirculari, transverse dilatata; peristomate incrassato, vix expanso, marginibus approximat, callo junctis, columellari reflexiusculo.

Diam. maj. $23\frac{1}{2}$, min. 20, alt. 16 mill.

Hab. —?

34. *CYCLOSTOMA LURIDUM* (CYCLOPHORUS), Pfr. *C. testa umbilicata, depresso-turbinata, tenuiuscula, confertim spiraliter striata et costis sub-5 obtusis superne munita, nitida, fusco-fulvida; spira turbinata, apice livida, acutiuscula; anfractibus 5, modice convexis, ultimo ad peripheriam obtuse angulato et albofasciato, basi pallidiore, obsolete fasciato; umbilico angusto, pervio; apertura magna, parum obliqua, subangulato-circulari; peristomate simplice, tenui, marginibus disjunctis, dextro breviter expanso, sinistro subdilatato, fornicato-patente.*

Diam. maj. 27, min. 23, alt. 19 mill.

Hab. —?

35. *CYCLOSTOMA FULGURATUM* (CYCLOPHORUS), Pfr. *C. testa umbilicata, depresso-turbinata, solida, oblique striatula, sub lente confertissime decussata, alba, strigis fulguratis, castaneis superne elegantissime picta; spira turbinata, apice obtusula, cornea; anfractibus 5, convexis, ultimo rotundato, ad peripheriam fascia alba et infra eam, nigricanti-castanea ornato, circa umbilicum angustum, vix pervium albo; apertura parum obliqua, subcirculari, intus livescens, nitida; peristomate simplice, fulvido, interrupto, marginibus callo tenui junctis, dextro et basali aequaliter expansis, columellari supra umbilicum dilatato, patente.*

Diam. maj. 29, min. 23, alt. 19 mill.

Hab. —?

36. *CYCLOSTOMA BORNII* (LICINA?), Pfr. *C. testa umbilicata, oblongo-turrita, solida, spiraliter confertim striata, lineis longitudinalibus distantioribus granulato-decussata, nitida, luteo-albida, strigis angustis, fulguratis, rufis ornata; spira convexo-turrita, breviter truncata; sutura subcanaliculata, crenulata; anfractibus $4\frac{1}{2}$, perconvexis, ultimo terete; umbilico infundibuliformi, subpervio; apertura parum obliqua, oblongo-rotundata, parvula, intus alba; peristomate duplicato interno expanso, continuo, incumbente, externo anfractui penultimo breviter adnato, lateribus perdilatato, concentrice striato.*

Long. 36, diam. 19 mill.

Hab. —?

37. *CYCLOSTOMA MITE* (CHOANOPOMA), Pfr. *C. testa umbilicata, turbinato-globosa, breviter truncata, liris obtusis spiralibus munita, costulis membranaceis confertissimis decussata, unicolore corneo-albida; spira convexa, brevi; anfractibus $3\frac{1}{2}$, convexis, ultimo terete, circa umbilicum mediocre, pervium, distinctius spiraliter lirato; apertura verticali, circulari; peristomate duplici, interno vix porrecto, externo undique aequaliter dilatato,*

patente, obsolete undulato, concentrice striato, superne subangulato, ad anfractum penultimum subemarginato.

Diam. maj. 13, min. 10, alt. 9 mill.

Hab. in insula Jamaica.

38. *CYCLOSTOMA VITELLINUM* (OTOPOMA?), Pfr. *C. testa umbilicata, globoso-conica, solida, striis incrementi confertis et liris confertissimis scabre decussata, flavido-rubella, pallidius irregulariter strigata; spira elevato-conica, apice nigrescente, obtusula; anfractibus 5, convexis, ultimo rotundato, infra medium sublævigato, in umbilico angusto, pervio, spiraliter sulcato, apertura vix obliqua, ovali-rotundata; peristomate simplice, marginibus approximatis, callo junctis, dextro subrepando, recto, sinistro medio dilatato, patente.*

Diam. maj. 19, min. 17, alt. 17 mill.

Hab. in insula Madagascar.

39. *CYCLOSTOMA LIRATUM* (TROPIDOPHORA), Pfr. *C. testa late et perspective umbilicata, solidula, radiatim striata, superne et basi confertim et acute lirata, non nitida, livido-carneae; spira vix elevata, vertice papillari; sutura profunda; anfractibus 4 vix convexis, ultimo ad suturam depresso, ad peripheriam carinis 5-6, distantioribus, majoribus munito, antice descendente; apertura perobliqua, oblongo-circulari; peristomate duplice, interno continuo, obtuse prominente, externo dilatato, expanso inflexo, latere sinistro angustissimo.*

Diam. maj. 18, min. 14½, alt. 7-8 mill.

Hab. —?

40. *CYCLOSTOMA KRAUSSIANUM* (TROPIDOPHORA), Pfr. *C. testa umbilicata, globoso-conica, solidula, striatula, liris cariniformibus permultis, alternis minoribus sculpta, opaca, livido-cinerea, obsolete subfasciata; spira turbinata, acutiuscula; anfractibus 5, convexis, ultimo peripheria distinctius carinato, basi parum convexo; umbilico mediocri, pervio; apertura parum obliqua, intus fulvo-cinerea; peristomate albo, tenui, undique expanso, ad anfractum penultimum breviter interrupto.*

Diam. maj. 14½, min. 12, alt. 12 mill.

Hab. Cape Natal.

41. *CYCLOSTOMA INSULARE* (CYCLOSTOMUS?), Pfr. *C. testa perforata, globoso-conica, solidiuscula, spiraliter et obtuse crebri-lirata, lineis confertissimis longitudinalibus subscabra, non nitente, sordide albida, fasciis nonnullis pallide violaceis picta; spira breviter turbinata, obtusula; anfractibus 5, convexis, ad suturam minutissime crenulatis, ultimo basi liris elevatioribus sculpto; apertura vix obliqua, subangulato-circulari; peristomate tenui, undique expanso, reflexiusculo, marginibus approximatis, callo subemarginato junctis, supero repando, sinistro angustiori.*

Diam. maj. 17, min. 13½, alt. 13½ mill.

Hab. Isle de France.

42. *CYCLOSTOMA CAROLINENSE* (*CYCLOSTOMUS*?), Pfr. *C. testa umbilicata, turrato-conica, tenuiuscula, superne leviter et confertim spiraliter lirata, nitidula, alba; spira elongata, apice obtusula; anfractibus 6, convexis, ultimo rotundato, infra medium laevigato; umbilico angusto, non pervio; apertura vix obliqua, subcirculari; peristomate simplice, acuto, marginibus approximatis, dextro recto, columellari medio dilatato, subreflexo.*

Diam. maj. 12, min. 10, alt. 12 mill.

Hab. in insulis Carolinis.

43. *CYCLOSTOMA SUBLIRATUM* (*CYCLOSTOMUS*?), Pfr. *C. testa angustissime umbilicata, globoso-conica, tenui, spiraliter lirata, haud nitente, pallide rubello-cornea; spira elevato-turbinata, apice obtusula; anfractibus 5, convexis, ultimo rotundato, obsoletius lirato; apertura parum obliqua, oblongato-rotunda; peristomate simplice, tenui, vix expansiusculo, marginibus fere contiguus, callo junctis.*

Diam. maj. 10, min. 8, alt. 9 mill.

Hab. —?

44. *CYCLOSTOMA LINEATUM* (*CYCLOSTOMUS*?), Pfr. *C. testa umbilicata, globoso-conica, tenuiuscula, laevigata, diaphana, nitidula, fulva, lineis castaneis, alternis subtilioribus, subinterruptis, picta; spira turbinata, acutiuscula; anfractibus $5\frac{1}{2}$, convexis, ultimo rotundato, infra peripheriam fascia latiore ornato, in umbilico angusto, vix pervio spiraliter confertim sulcato; apertura vix obliqua, subangulato-circulari; peristomate simplice, recto, albo, marginibus approximatis, callo subemarginato junctis.*

Diam. maj. 15, min. 13, alt. 13 mill.

Hab. —?

45. *CYCLOSTOMA SACCATUM* (*CYCLOSTOMUS*?), Pfr. *C. testa profunde rimata, vix perforata, ovato-oblonga, breviter truncata, tenui, longitudinaliter confertim filoso-costata, diaphana, pallide cornea, maculis castaneis seriatis ornata; sutura profunda, sub lente spinulosa; anfractibus $3\frac{1}{2}$, convexis, ultimo antice subascendente, breviter soluto, basi saccato; apertura subcirculari, basi axin excedente; peristomate simplice, continuo, vix expansiusculo. — Operc.?*

Long. 12, diam. 8 mill.

Hab. —?

46. *CYCLOSTOMA FALLAX* (*CISTULA*?), Pfr. *C. testa rimata, oblongo-turrita, truncata, tenui, spiraliter obtuse lirata, lineis longitudinalibus confertioribus (octava vel decima quavis sub lente validioribus) decussata, non scabra, vix nitidula, albida, lineis flexuosis, interruptis, fulvis picta; spira subconvexo-turrita; anfractibus $4-4\frac{1}{2}$, convexiusculis, ultimo rotundato, infra medium fascia fulva ornato, antice longe soluto, circa rimam umbilicalem vix spiraliter sulcato; apertura subverticali, ovali;*

peristomate albo, duplice: interno expansiusculo, incumbente, externo brevi, undique subæqualiter patente, superne angulato.—Operc.?

Long. 24, diam. $6\frac{1}{2}$ mill.

Hab. —?

47. *CYCLOSTOMA JUCUNDUM* (CHONDROPOMA?), Pfr. *C. testa rimata, oblongo-turrita, tenui, lineis spiralibus et longitudinalibus chordæformibus anguste reticulata, subscabra, viz nitidula, aurantio-rubicunda; spira turrita, viz truncatula; sutura confertim denticulata; anfractibus 6-7, modice convexis, sensim accrescentibus, ultimo circa perforationem liris nonnullis validioribus munito; apertura parum obliqua, irregulariter ovali, intus concolore, nitida; peristomate duplice: interno expansiusculo, incumbente, latere sinistro levissime arcuato; externo continuo, horizontaliter patente, anfractui penultimo breviter adnato, infra perforationem angustato.—Operc.?*

Long. 18, diam. $8\frac{1}{2}$ mill.

Hab. —?

48. *CYCLOSTOMA ROSTRATUM*, Pfr. *C. testa perforata, ovato-turrita, truncata, tenui, longitudinaliter confertim filoso-plicata (plicis singulis irregulariter positis validioribus, interstitiis subtiliter decussatis), corneo-albida, lineolis longitudinalibus undulatis fuscis picta; sutura levi, denticulata; anfractibus superstitibus $4\frac{1}{2}$, parum convexis, ultimo antice breviter soluto; apertura verticali, angulato-ovalis; peristomate duplice: interno continuo, expansiusculo, externo dilatato, juxta anfractum penultimum subexciso, superne in auriculam recurvatam producto, cæterum rectangule patente.—Operc.?*

Long. 18, diam. $8\frac{3}{4}$ mill.

Hab. —?

49. *ACHATINA GRANULATA*, Pfr. *A. testa fusiformi-ovata, tenui, longitudinaliter confertim rugulosa, lineis impressis spiralibus distincte granulata, fulva, strigis castaneis undatis et angulatis picta; spira conica, obtusa; sutura levi, ruditer crenulata; anfractibus $7\frac{1}{2}$, convexiusculis, ultimo spiram paullo superante, infra medium remotius spiraliter sulcato; columella perarcuata, tenui, basi abrupte truncata; apertura parum obliqua, ovali, intus cærulescente; peristomate simplice, recto, fusco-limbato.*

Long. 105, diam. 49 mill.

Hab. Natali Africæ meridionalis.

50. *ACHATINA FULIGINEA*, Pfr. *A. testa ovato-turrita, solida, ruditer striata, nitida, nigricanti-fuliginea; spira turrita, apice acuta; anfractibus $6\frac{1}{2}$, convexis, ultimo $\frac{1}{4}$ longitudinis subæquante, infra medium obsolete angulato; columella arcuata, ad basin verticaliter truncata; apertura parum obliqua, subrhombico-ovalis; peristomate simplice, acuto.*

Long. 36, diam. 16 mill.

Hab. —?

51. *ACHATINA CONSPERSA*, Pfr. *A. testa subfusiformi-oblonga, tenuiuscula, longitudinaliter striata, striis transversis basin versus obsoletioribus decussata, nitida, fusca, maculis albidis conspersa; spira elongato-conica, apice obtusula; sutura dentibus validis, albidis crenata; anfractibus 6, vix convexiusculis, ultimo spira paulo brevior, basi subattenuato; columella substriata, supra basin apertura fere verticali, sinuato-semiovali late et abrupte truncata; peristomate simplice, acuto.*

Long. 60, diam. 23 mill.

Hab. —?

52. *ACHATINA FUSCA*, Pfr. *A. testa oblongo-turrita, tenui, confertissime capillaceo-striata (striis singulis validioribus, variciformibus), sericina, fusca; spira vix curvilineari, apice obtusa; sutura marginata, subtilissime denticulata; anfractibus 7, convexis, ultimo $\frac{3}{4}$ longitudinis æquante, basi rotundato; columella albo-callosa, leviter arcuata, abrupte breviter truncata; apertura verticali, sinuato-semiovali; peristomate simplice, recto.*

Long. 22, diam. 9 mill.

Hab. —?

53. *BULIMUS MARCIDUS*, Pfr. *B. testa subperforata, ovato-oblonga, tenuissima, striatula, lineis impressis concentricis decussata, vix nitida, pellucida, sordide cornea; spira oblongo-conica, obtusiuscula; anfractibus 6, vix convexis, ultimo spiram æquante, basi subattenuato; columella superne recedente, tum verticali; apertura obliqua, ovali; peristomate simplice, vix expansiusculo, margine columellari reflexiusculo, subappresso.*

Long. 20, diam. 8 mill.

Hab. in Brasilia.

54. *BULIMUS DENTICULATUS*, Pfr. *B. testa sinistrorsa, rimata, cylindraceo-turrita, solidula, oblique striatula, oleoso-micante, cornea; spira elongata, sursum attenuata, acutiuscula; anfractibus 10, angustis, convexiusculis, ultimo $\frac{3}{4}$ longitudinis æquante, basi subcristato; apertura obliqua, semiovali, denticulis 4 munita: 1 juxta insertionem marginis sinistri, 1 profundo parietali, 1 ad basin columellæ arcuato-callosæ, quarto in margine externo; peristomate albo-callosa reflexiusculo.*

Long. 7, diam. $2\frac{1}{2}$ mill.

Hab. Harmanjiæ.

55. *BALEA NEWCOMBI*, Pfr. *B. testa sinistrorsa, brevissime rimata, turrita, tenui, striatula, nitida, pellucida, pallide cornea, fascia 1 rufa ornata; spira elongata, acuta; anfractibus 7, planiusculis, ultimo $\frac{1}{2}$ longitudinis subæquante, ad parietem aperturalem lamella obliqua munito, basi rotundato; columella suborto-plicata; apertura obliqua, semiovali; peristomate tenui, expansiusculo, margine columellari superne dilatato, reflexo.*

Long. 7, diam. 3 mill.

Hab. in insulis Sandwich (*Newcomb*).

56. *TORNATELLINA ACHATINOIDES*, Pfr. *T. oblonga, subcylindracea, solidula, lævigata, pallide cornea; spira elongata, sursum attenuata, acutiuscula; sutura submarginata; anfractibus 7, planiusculis, ultimo $\frac{2}{3}$ longitudinis æquante; lamella parietali parvula, profunda; columella bituberculata, subtruncata; apertura subverticali, rhombeo-semiovali; peristomate simplice, obtuso.*

Long. 12, diam. 4 mill.

Hab. in insulis Gambier.

57. *CYLINDRELLA CARINATA*, Pfr. *C. testa vix rimata, subcylindracea, sursum attenuata, truncata, oblique striata, sericina, carneo-fulvida; anfractibus superstitibus 12, planiusculis, ultimo breviter soluto, basi compresse carinato; apertura obliqua, ovali, basi angulata; peristomate undique breviter expanso.*

Long. 22, diam. 4 mill.

Hab. — ?

58. *CYLINDRELLA ZEBRINA*, Pfr. *C. testa subrimata, fusiformi-oblonga, truncata, solida, striatula, nitida, albida, strigis spadiceis irregulariter picta; anfractibus superstitibus 8, vix convexiusculis, ultimo distincte costulato-striato, basi compresso-carinato, pone aperturam nigro-cingulato; apertura vix obliqua, ovali, basi canaliculata; peristomate expanso, tenui, albo, marginibus non contiguis, dextro subrependo.*

Long. 21, diam. 6 mill.

Hab. in insula Jamaica.

59. *CYLINDRELLA BLANDIANA*, Pfr. *C. testa brevissime rimata, oblongo-turrita, truncata, solida, undique oblique costulato-striata, nitida, saturate castanea, apice nigricante; anfractibus superstitibus 8, convexiusculis, ultimo nigricante, late albo-fasciato, basi leviter carinato; apertura vix obliqua, lunari-rotundata; peristomate crasso, expanso, margine dextro superne repando, columellari superne noduloso.*

Long. 19, diam. 7 mill.

β. *Robustior, virenti-albida, peristomate albo.*

Hab. in Jamaica.

60. *PUPA CUMINGIANA*, Pfr. *P. testa profunde rimata, ovato-oblonga, solidula, irregulariter filoso-striata, alba, maculis fusco-corneis superne subtessellata; spira convexa, sursum sensim attenuata, apice corneo acutiuscula; sutura lineari; anfractibus 9, subplanis, ultimo $\frac{1}{2}$ longitudinis paulo superante, antice ascendente, basi justa rimam subcompressa; columella profunde dentato-plicata; pariete aperturali plica mediocri intrante munito; apertura verticali, truncato-ovalis; peristomate calloso, undique breviter expanso, marginibus conniventibus, callo tenui junctis, dextro arcuato, columellari subdilatatato.*

Long. 17, diam. 7½ mill.

Hab. — ?

61. PUPA KÜSTERI, Pfr. *P. testa profunde et breviter rimata, ovato-conica, solida, plicis subconfertis longitudinalibus, ad suturam incrassatis, regulariter munita, albida, pallide corneo-strigata et marmorata; spira medio turgida, tum in conum obtusulum regulariter attenuata; anfractibus $8\frac{1}{2}$, planiusculis, ultimo $\frac{2}{3}$ longitudinis subæquante antice subascendente, basi vix compressiusculo; apertura vix obliqua, semiovali, plica parietali et columellari profunde coarctata; peristomate incrassato, breviter expanso, marginibus callo tenui junctis.*

Long. 12, diam. supra medium 6 mill.

Hab. — ?

62. PUPA NEWCOMBI, Pfr. *P. testa subperforata, ovata, tenui, longitudinaliter costata, haud nitente, diaphana, saturate fusca; spira inflata, apice acutiuscula; anfractibus 4, convexis, ultimo $\frac{2}{3}$ longitudinis subæquante, basi rotundato; apertura obliqua, semicirculari; peristomate tenui, vix expansiusculo, margine columellari subreflexo.*

Long. 2, diam. 1 mill.

Hab. in insulis Sandwich (Newcomb).

63. PUPA OBLONGA, Pfr. *P. testa subperforata, oblonga, tenui, sublævigata, parum nitida, pellucida, corneo-lutescente; spira convexa, sursum sensim attenuata, apice obtusula; anfractibus $5\frac{1}{2}$, convexis, ultimo $\frac{1}{2}$ longitudinis vix æquante, basi rotundato; columella obsolete plicata; apertura obliqua, truncato-ovali; pariete aperturali plica unica dentiformi munito; peristomate tenui, margine dextro superne valde curvato, expansiusculo, columellari subdilato, patente.*

Long. $2\frac{1}{2}$, diam. $1\frac{1}{2}$ mill.

Hab. — ?

64. PUPA BARBADENSIS, Pfr. *P. testa subperforata, ovato-oblonga, tenui, sublævigata, pellucida, lutescenti-hyalina; spira convexiuscula, sensim attenuata, apice obtusula; anfractibus $5\frac{1}{2}$, rotundatis, ultimo $\frac{1}{2}$ longitudinis vix æquante; pariete aperturali plica valida, subangulari munito; columella profunde dentatoplicata; apertura obliqua, lunato-rotundata; peristomate simplice, expansiusculo, margine basali intus denticulo unico armato.*

Long. $2\frac{1}{2}$, diam. $\frac{3}{4}$ mill.

Hab. in insula Barbadoes.

65. PUPA STRANGEI, Pfr. *P. testa sinistrorsa, rimata, oblongo-conica, striatula, nitida, hyalina; spira convexo-turrita, apice acutiuscula; anfractibus 5, convexiusculis, ultimo $\frac{2}{3}$ longitudinis subæquante, antice costato, basi subgibboso-compresso; apertura subverticali, magna, truncato-ovali, sub-7-dentata; plicis 2, approximatis, in pariete aperturali, 2 in columella, dentibus 3, profundis, in margine externo et basali; peristomate albo-callosa, undique expanso.*

Long. 3, diam. $1\frac{1}{2}$ mill.

Hab. Gordon Island, Port Jackson (Strange).

66. PUPA CONOIDEA, Newcomb MSS. *P. testa perforata, globoso-conica, tenui, striatula, diaphana, parum nitida, fusca; spira conoidea, apice obtusa; anfractibus 4½, convexis, ultimo ½ longitudinalis equante, basi rotundato; apertura parum obliqua, semicirculari, edentula; peristomate simplice, expansiusculo, margine collemellari subdilato, patente.*

Long. 1½, diam. 1 mill.

Hab. in Demerara (Newcomb).

3. ON A NEW SPECIES OF SUTHORA FROM CHINA.

BY G. R. GRAY, F.L.S., F.Z.S. ETC.

SUTHORA WEBBIANA. (Aves, Pl. XLIX.)

Crown of the head and back of the neck sandy red, passing into the olive tint of the back and upper surface generally; tail of the same colour, but of a shade darker than the back; primaries strongly edged with bright rufous; throat and breast light buff, washed with a rosy tint; abdomen inclined to olive; bill light brown, washed with rosy pink; legs either yellow or fleshy white.

Hab. China (Shang Hai).

A single specimen, collected by Mr. Webb, was presented by that gentleman to the British Museum. It is much larger than *S. nipalensis* and *fulvifrons*, and is figured of the natural size in the plate.

March 23, 1852.

Professor Owen, F.R.S., Vice-President, in the Chair.

Mr. Broderip communicated an account of a picture in his possession, which he exhibited, containing an original study of the Dodo from life, by Rolandt Savery*.

The following papers were read:—

1. ON THE SPECIES OF THE GENUS SERICINUS.

BY G. R. GRAY, F.L.S., F.Z.S. ETC.

In the Transactions of the Entomological Society of London for 1851 (p. 173), Mr. Westwood established a Lepidopterous genus under the name of *Sericinus*, which he founded on bad specimens of an insect sent from Shanghai by Mr. R. Fortune, and then supposed to comprise "both sexes" of the insect figured by Donovan in his 'Insects of China,' pl. 27. f. 1, under the appellation of *Papilio Telamon*, no specimen of which, as Mr. Westwood justly observed, was then known to exist "in any continental or British collections."

* A portion of this Picture will be engraved in the Transactions.

Lately Mr. Fortune has returned to this country, bringing with him many specimens of the same insect in a more perfect state, which enables me to take up the genus and endeavour to define the species and give characters for each. I should state, however, that I think I shall be able to point out that these "two sexes" are, in fact, distinct species of the genus.

I think it best, first, to give a description of the species figured by Donovan under the name of *Papilio Telamon*, but which will now stand under that of

SERICINUS TELAMON, Westw.

The fore wings yellowish white, with the anterior and most of the exterior margins rather broadly edged with black; an abbreviated line in the middle, another at the anterior part of the costal area, and then a curved line of irregular spots, which ends towards the posterior angle, and with two small spots at the anterior angle near the outer margin, also one spot on the inner margin, black. The hind wings yellowish white, with the anal angle black, which apparently extends towards the anterior margin by two oblong spots of the same colour; the anal angle is ornamented by a crimson line that reaches to the third nervure from the inner margin; there are also three pale blue lunes. The under surface of the fore wings is very similar to the upper side, except that the black which surrounds the anterior and part of the exterior margins is not apparent. The under surface of the hind wings is also similar to the upper side, except that the spot of the anterior margin is ornamented by a crimson centre.

Donovan informs us that the only specimen brought to Europe was taken near Pekin, by a gentleman in the suite of Earl Macartney, and was at that time, when Donovan figured it, in the possession of Mr. Francillon.

Having thus recorded the peculiarities of the species which must be considered the type of this genus, I shall now point out how one series of specimens brought by Mr. Fortune differ from it, though in general they are very similar to the one just described. Yet the uniformity of all the specimens of the series, which comes nearest to Donovan's figure, induces me, provisionally at least, to form it into a separate species, under the name of

SERICINUS MONTELA*. (Cat. of Lepid. B. M. i. 78. pl. 13. fig. 1, 2.)

Like the preceding; but the fore wings have a large subtriangular black spot very near the base, which is divided into three spots by the nervures. The anterior margin is slightly edged, and the exterior margin is, for most part, broadly margined with black. The hind wings have a broad band obliquely across the costal area, and the crimson band at the anal angle appears broader in this species.

* *Sericinus Telamon*, Westw. & Hewits. Gen. Diurnal Lep. p. 530 suppl. pl. 1. fig. 1.

The species is always, as Mr. Fortune has kindly informed me, found in the valleys among the hills.

*SERICINUS FORTUNEI**. (Cat. Lep. B. M. i. pl. 13. fig. 5.)

The fore wings are yellowish white, with many irregular black spots which vary in size, some of them so placed that they apparently form five bands across the wing; the external margin is also black. The hind wings also yellowish white, with a basal band and three irregular curved bands of black spots; the second band from the base is broadest at the anterior angle, and marked with a small crimson spot; while that portion towards the anal angle is margined exteriorly by an irregular crimson band, which extends from the angle to the fifth nervure; the third or marginal band is ornamented on the deep black below the crimson by a series of pale blue lunes. The under surfaces of all the wings are less prominently marked, otherwise they are similar to the upper side, except that on the fore wings there are two crimson spots, one on the band near the costal area and the other on the posterior margin.

This species is found, according to Mr. Fortune, on the sides of the hills.

Mr. Wilson Saunders has obliged me by the loan of a specimen for examination, which presents several differences from those previously noticed. It is rather smaller and the caudal appendages are shorter than in the other three species; the latter being only about half an inch in length. These with other characters induce me to form it into a species under the name of

SERICINUS TELMONA†. (Cat. Lep. B. M. i. pl. 13. fig. 3.)

The fore wings ochraceous, with the base black, and the other black markings placed as in *S. Montela*, though not quite so prominent, but the short band which crosses the wing just beyond the costal area and the spot on the posterior margin are both ornamented with a small crimson spot. The hind wings have the inner margin black, and are without the basal spot in the costal area; the crimson band at the anal angle extends, as in *S. Fortunei*, to the fifth nervure, and like it also the spot on the anterior margin is ornamented by a crimson mark, which is more equally placed with the commencement of the crimson band that advances to the anal angle, than in the other species; the black space at the anal angle is less in size, but is furnished with blue lunes. The under surface of the fore wings is marked like the upper side. That of the hind wings is also similar to the upper side, but the black spots on the anterior margin are both ornamented with crimson; the lengthened crimson band is marked between the second and third nervures from the anal

* *Sericinus fasciatus*, Brem. & Grey, Beitr. Schm. des Nörd. China, p. 5. Since this paper was read, Mr. Fortune has sent a series of specimens which show that this is the female of the preceding.

† The female of this species is described as *Sericinus Greyi*, Brem. & Grey, Beitr. Schm. des Nörd. China, p. 6.

angle with a white lune, and there is also a less quantity of black at the anal angle.

This species (male) was also brought to this country with the others by Mr. Fortune, through whose exertions we are thus enabled to describe three additional species of a division which had been hitherto only known by the one figured by Donovan.

2. NOTES ON THE DISSECTION OF A SPECIES OF GALAGO. BY W. H. FLOWER, CURATOR TO THE MIDDLESEX HOSPITAL MUSEUM.

Having recently had an opportunity of examining the body of a Galago which died in the Society's Gardens, and which I believe to be an undescribed species, I proceed, at the request of the Secretary, to lay before the Society some notes on its anatomy made during the dissection.

The animal was a male. When I received it the skin was removed, and its dimensions were as follows:—

	in.	lin.
Length of the head and body	9 $\frac{1}{2}$	0
— of the tail	13 $\frac{1}{2}$	0
— of the head	2	7
Breadth of the head (at the widest part, viz. the malar bones)	1	9
Length of the humerus	2	3
— of the fore-arm	2	7
— of the hand	1	0
— of the femur	3	0
— of the tibia	3	0
— of the foot	3	0
Dentition:—inc. $\frac{4}{8}$; can. $\frac{1-1}{1-1}$; mol. $\frac{5-5}{5-5}=34$.		

The upper incisors very small, placed vertically, a considerable space existing between the two middle ones. The lower incisors long, very narrow, projecting horizontally, and closely approximated.

The stomach was simple, almost globular in form; the œsophagus entered far to the right, the cardiac orifice very nearly approaching the pyloric, so that while the greater curvature measured 6 $\frac{1}{2}$ inches, the lesser was but $\frac{2}{3}$ of an inch. The small intestines were wide, 46 inches in length. The cœcum was nearly 5 inches long, wider near its commencement than any part of the intestine, and slightly sacculated, but tapering and becoming smooth towards the extremity. The ileum entered the colon at a very obtuse angle, and there was scarcely any difference in the calibre of these two parts of the intestine. The colon was without sacculations and peculiar in form, being widest at the upper end, then gradually contracting till it became narrower than any part of the intestine, and dilating again into the rectum; and this appeared not to be the result of muscular contraction, as it

retained this form after macerating in water several days and then inflating. The length of this part of the intestine, from the ileo-cæcal valve to the anus, was 18 inches.

The liver presented three very distinct lobes : the left one was entire ; the middle cleft into three by two fissures on its under surface, in one of which (that most to the right) the gall-bladder was placed ; the right lobe was entire, but on its under surface was placed the lobulus Spigelii.

The gall-bladder was pyriform ; the duct, 3 lines in length, joining the hepatic duct, formed the common gall-duct, which was half an inch long and entered the duodenum one inch from the pylorus.

The spleen was long, narrow and flattened, half an inch wide at the broadest part, and $2\frac{1}{2}$ inches in length.

The kidneys, simple, large and oval, were 1 inch long and 8 lines broad ; the right one situated nearly the whole length of the kidney higher than the left.

The penis was 3 inches in length, containing a bone 11 lines long. The skin of the glans covered with minute spines or tubercles, which, when examined microscopically, were found to be tooth-like bodies, most having two points, some one, others three or more, all directed backwards.

The testes were oval, 8 lines long, 5 broad.

The vesiculæ seminales consisted of two large simple culs-de-sac, 7 lines in length.

On opening the thorax the left lung was found to have two lobes, the right four.

The heart presented nothing unusual. From the arch of the aorta two large vessels arose, the first giving rise to the innominate and left carotid ; the second being the left subclavian.

On examining the brachial and femoral arteries, no division into smaller trunks, forming a rete mirabile, as is observed in several animals belonging to this family, was discovered. The brachial artery perforated the humerus near its lower extremity.

The tongue was long and narrow, $2\frac{1}{2}$ inches long from the root of the epiglottis to the tip, and 5 lines broad. Its dorsal surface was covered with small papillæ, and at the posterior part were three large or circumvallated papillæ, arranged as the points of the letter V. On the under surface is a curious body, 7 lines long and 3 wide, the tip of which is free, flat and pectinated, the rest free at the sides and attached in the middle. From the form, position and size of this singular organ, one cannot help conjecturing that the pectinated end may act as a brush to free the inferior incisor teeth from adherent particles of the insect food on which the animal subsists.

The submaxillary and parotid glands were very large, particularly the former.

The masseter and temporal muscles were largely developed, and the whole muscles of the upper extremity very powerful.

The cerebral hemispheres were large, and extending some way back over the cerebellum, but their surface was remarkably smooth

and almost free from convolutions, resembling in this respect the brain of Cheiroptera, to which order the Lemurs present several points of affinity.

April 27, 1852.

W. J. Broderip, Esq., F.R.S., Vice-President, in the Chair.

Mr. Strickland read a paper "On some Bones of Birds allied to the Dodo, in the collection of the Society;" which will appear in the Society's Transactions.

May 25, 1852.

J. Gould, Esq., F.R.S., Vice-President, in the Chair.

The following papers were read :—

1. DESCRIPTIONS OF A FEW NEW RECENT SPECIES OF BRACHIOPODA. BY TH. DAVIDSON, F.G.S., MEMBER OF THE GEOL. SOC. OF FRANCE, ETC.

(Mollusca, Pl. XIV.)

In the valuable collection of recent Brachiopoda assembled by Mr. Cumming, some species seem new, and undescribed in Mr. Sowerby's Monograph; and it is at that gentleman's request that I have prepared the following descriptions and illustrations, which will complete, with one exception, the *Ter. septigera* of Lovén (still unfigured), all the new recent forms which have hitherto come under my observation.

In a paper lately published in the 'Annals and Mag. of Nat. Hist.' for May 1852, I endeavoured to class all the recent species according to their internal organization, into *four families* and *thirteen genera*, or *sections*, as it is evident that these, as well as the fossil forms, must be comprised in the proposed subdivisions introduced within the last few years with more or less success into the nomenclature; and singular enough, notwithstanding the greater facilities of examining both the internal arrangements as well as the animal in recent forms, these important characters have not yet been made use of by malacologists, who still place nearly all these Terebratuliform shells in one genus, *Terebratula*; while palæontologists, working under much greater difficulties, have by dint of perseverance and trouble discovered the

organization of a multitude of extinct forms, filled by the hardest matrix: and I have no doubt but that before very many years the internal details of all the fossil species will be as well known as if they were in the recent state.

Much, however, remains to be done before the proposed classifications can be decidedly and definitely adopted, and many modifications will be considered requisite, as it is evident, from our present knowledge, that some genera or sections are more or less closely related, and that certain species possess characters common to more than one genus, but these examples are few and exceptional in comparison to those presenting a similar organization: thus all forms with a free, simply attached loop, as in *Ter. Australis*, *Ter. Californiana*, &c., must be placed in the same section; all those with the loop affixed to the hinge plate and to a central more or less elevated septum, such as *Ter. dorsata*, *Ter. rubicunda*, &c., into another group; those also in which the calcareous appendages consist of only two central diverging lamellæ, such as *Ter. rubra*, *Ter. pisum*, and others, must necessarily be placed close to each other, &c. The arrangement of the species is, therefore, not a matter of indifference, but ought to partake of those rules, followed for the other classes of Mollusca, wherein genera are often admitted on far less important differences.

A complete monograph of the recent species thus framed, with figures, synonyms, dates, &c., is still a desideratum, and I hope ere long that the science of Conchology will be enriched by such a valuable and necessary contribution.

The only object of this short paper is to describe some unfigured forms, to which I have added some remarks on a few species not hitherto completely understood.

1. *TEREBRATULA GRAYII*, DAV. 1852. (Pl. XIV. fig. 1-3.)

Diagnosis.—Shell irregularly pentagonal, rather broader than long; valves unequally convex (the perforated being gibbous and the smaller valve rather flattened); beak not much produced, truncated by a very large emarginate foramen—the deltidial plates are disunited, a small portion of the aperture being completed by the umbo; hinge-line straight; beak-ridges sharply defined, leaving between them and the hinge-margin a wide, almost flat area; surface ornamented by a great number of irregular and unequal radiating costæ, augmenting rapidly from numerous bifurcations and intercalations of smaller plaits between the larger costæ; colour partly yellow and red, this last becoming more vivid as it approaches the concentric lines of growth; structure punctate; internal appendages consisting of a simply attached loop, the riband-shaped lamella extending to about four-fifths of the length of the shell before bending back on itself. Dimensions variable: length 14, width 15, depth 9 lines.

Hab. Coast of Korea. Coll. Cuming.

Obs.—This fine species has been known to me for several years, but unobserved by other collectors, who erroneously supposed it to be the *Ter. rubra* of Pallas, to which it bears some external resemblance,

but is essentially different in its internal arrangements; the loop of our new form being similar to that of *Ter. australis* or *Ter. lenticularis*, &c., while the appendages of *Ter. rubra*, which is the type of my lately proposed genus *Kraussia*, consist only of two central diverging branches, somewhat spread out at their extremities. *Ter. Grayii* is also distinct from *Terebratella Zelandica*, the loop of this last being doubly attached, as in all the species of that section.

2. *TEREBRATELLA BOUCHARDII*, Dav. 1852. (Pl. XIV. fig. 4-6.)

Diagnosis.—Shell of a suborbicular or trapezoidal form, longer than wide, or broader than long; perforated valve most convex, laterally compressed and keeled, the imperforated valve presenting a longitudinal depression extending from about the middle of the valve to the front; beak produced, recurved and truncated by a large circular and entire foramen; deltidium in two pieces, meeting at the umbo; beak-ridges defined, leaving between them and the hinge-margin a slight concave false area; surface smooth, interrupted only by a few concentric lines of growth; colour light yellow; internal calcareous lamellæ fixed first to the crural base, and again to the longitudinal mesial septum, before attaining their greatest length and bending back on themselves to form the loop; structure punctate. Length 14, width 13, depth 8 lines.

Hab. Unknown. Coll. of Mr. Cuming.

Obs.—This species seems to differ from *Terebratella Coreanica* of Adams and Reeves principally in the form of its beak and in its coloration; the Corean form is beautifully strigated with vivid red, while *Ter. Bouchardii* is of a uniform light yellow colour; the details of the loop seem likewise to differ a little.

3. *TEREBRATELLA EVANSII*, Dav. 1852. (Pl. XIV. fig. 7-9.)

Diagnosis.—Shell subovate, longer than wide; perforated valve most convex, smaller one rather compressed; beak tapering, not much recurved, and obliquely truncated by an emarginate foramen; deltidia small; beak-ridges well defined, leaving between them and the hinge-margin a false area; surface ornamented by a few unequal bifurcated and intercalated costæ; colour pale red; structure punctate; apophysary system composed of a central longitudinal septum, not exceeding half the length of the valve, arising rapidly in the form of a narrow elevated plate, almost reaching the centre of the perforated valve, to the middle of which, and to the crural base, are doubly attached the calcareous ribband-shaped lamellæ forming the loop. Length 4, width $3\frac{1}{2}$, depth $1\frac{1}{2}$ lines.

Hab. New Zealand. Coll. Cuming.

Obs.—On first inspection, I thought this shell, of which Mr. Cuming has two examples, might be the young of *Terebratella Zelandica*; but on examining the calcareous appendages, I found great dissimilarity in their respective details. In *Ter. Zelandica* the loop is first fixed to the hinge plate, and again, by a transverse shelly horizontal process, to the extremity of a slightly elevated mesial septum; the lamella proceeding again before bending back, as in all *Terebratellæ*: but in the

interesting little form under notice the mesial septum forms a narrow elevated plate, extending as far and further than the greatest length of the lamellæ, which last are fixed to the middle portion of the septum. The remarkable deviation from the general details of the arrangements in this *Terebratella* has prompted me to examine with care a multitude of specimens of different species belonging to the genus, and I was not a little surprised to find that some few other forms presented a similar arrangement, such as *Ter. crenulata*, *Ter. Cumingii*, &c., thus forming a passage into *Magas*, which last, although generically distinct, can no longer constitute a separate family from the *Terebratulidæ*.

4. TEREBRATELLA? CUMINGII, DAV. 1852. (Pl. XIV. fig. 10, 16.)

Diagnosis.—Shell very thick, ovato-oblong; larger valve most convex, slightly keeled; imperforated one rather depressed; beak produced, tapering, not much recurved, and truncated by a small oval foramen, beginning at the summit of the beak, and directing itself on the opposite side to the area; no visible deltidium; a concave triangular area; surface smooth, strongly marked by concentric lines of growth; colour white, or slightly tinged with red; shell articulating by means of two strong teeth in the larger and corresponding sockets in the smaller valve; apophysary system very complicated, composed of a mesial longitudinal elevated triangular septum extending to about two-thirds of the length of the smaller valve, and which arising from under the cardinal process and crural base, by a gentle curve reaches and touches the larger valve near to its anterior portion, from whence it descends by an almost perpendicular line to the bottom of the valve; the calcareous ribband-shaped lamellæ first proceed from the socket walls, directing themselves by a gentle curve to the anterior portion of the septum, to which they become attached before bending on themselves to form a loop; the arms are of a brilliant red colour. Length 5, width 4, depth $2\frac{1}{2}$ lines.

Hab. New Zealand. Coll. Cuming.

Obs.—Two specimens of this remarkable shell have been obtained by Mr. Cuming, and it is one of the most interesting among the recent forms, presenting great difficulties from an assemblage of characters peculiar to more than one of the proposed sections. In outward shape, character of its foramen, and interior of perforated valve, it much resembles *Bouchardia rosea*; its foramen is likewise very similar in position to that presented by several species of *Trigonosemus*; the shape and position of its central elevated septum, which touches a portion of the centre of the larger valve, relates it to *Magas*, and the disposition of the lamellæ to *Terebratella*. I therefore do not feel certain in what genus this curious shell should be placed: it is not a true *Terebratella*, but there I have placed it for the present, on account of the form of the loop.

5. TEREBRATELLA SPITZBERGENSIS, DAV. 1852.

Diagnosis.—Shell ovate, slightly pentagonal, longer than wide; valves almost equally convex; beak produced, recurved, and truncated

by a middle-sized foramen; deltidium in two pieces, partly surrounding the aperture; beak-ridges not very sharply defined; smaller valve slightly depressed near the front; surface smooth, strongly punctate, and marked by a few concentric lines of growth; colour light yellow; apophysary system composed of a central longitudinal septum, extending to a little beyond half the length of the shell, in the form of a narrow plate somewhat elevated at its extremity, to which and to the hinge plate are attached the calcified riband-shaped lamellæ forming the loop. Length 4, width 3, depth 2 lines.

Hab. Spitzbergen.

Obs.—This small *Terebratella* seems distinguishable from all the other recent forms of the genus, by its dimensions, regular ovate shape, thinness of shell, and comparatively short, doubly-attached loop, which does not exceed half the length of the valve. I have hitherto been able to examine but one specimen, from the collection of Robert McAndrew, Esq., and Mr. Cuming.

6. *TEREBRATULINA CUMINGII*, DAV. 1852. (Pl. XIV. fig. 17-19.)

Diagnosis.—Shell ovate, somewhat pentagonal, nearly as wide as long; valves almost equally convex; beak small, obliquely truncated by a circular emarginate foramen; deltidial plates disunited, a small portion of the aperture being completed by the umbo; auricular expansions on either side of the umbo very small; surface ornamented by a great number of minute radiating elevated striæ, augmenting rapidly by the intercalation of smaller costæ at variable distances between the larger ones; the front margin of the larger valve indents the smaller one; colour white, tinged with yellow; structure punctate; internal apophysary supports short and annelliform. Length $3\frac{1}{2}$, width 3, depth 2 lines.

Hab. Chinese Seas. Coll. Cuming.

Obs.—This little *Terebratulina* may be easily distinguished from all the other recent species of the genus by its size and relative width and length, being much more convex and globular.

7. *MORRISIA ANOMIOIDES*, Scacchi, sp. 1843. (Pl. XIV. fig. 29.)

Orthis anomioides, Scacchi in Phil. Moll. Sicil. ii.

Terebratula appressa, Forbes, Report on the Mollusca and Radiata of the Ægean Sea, 1843.

Diagnosis.—Shell minute, circular, depressed; foramen large, round, encroaching equally on both valves; larger valve with a straight hinge-area; deltidial plates minute, widely separated; smaller valve deeply notched at the umbo; apophysary system consisting of two branches originating at the base of the dental sockets, and united to a small elevated process arising from the centre of the valve.

Animal furnished with two subspiral or *sigmoid* arms fringed with comparatively large cilia; the shell is of a green colour, with bright orange ovaries contrasting with the brilliant white of the ciliated arms; structure punctate. Length 1, width $1\frac{1}{2}$, depth $\frac{1}{4}$ line.

Hab. Mediterranean; depth 95 fathoms (Forbes).

Obs.—Some of Philippi's figures of *Ter. seminulum* are so like specimens of *T. appressa* (Forbes), that I at first imagined they might belong to the same type; and in my paper published in the 'Ann. and Mag. of Nat. Hist.' for May 1852, I placed *Ter. appressa* of Forbes as a synonym of Philippi's species: but since that period I have had reasons to believe this to be an error, and that in reality the Italian author's type does not belong to the same species nor even genus, but would be a synonym of *Argiope* (*Ter.*) *Neapolitana* of Scacchi. I have also ascertained that the shell and animal of this species are figured by Philippi, in the second volume of his 'Sicilian Mollusca.'

8. *KRAUSSIA LAMARCKIANA*, DAV. 1852. (Pl. XIV. fig. 22, 23.)

Diagnosis.—Shell of a somewhat tetragonal form, flattish, with a moderately deep longitudinal depression in the smaller valve and a corresponding keel in the larger one; hinge-line nearly straight; beak truncated by a large emarginate foramen, completed by two small deltidial plates, and by a portion of the umbo of the smaller valve; hinge-area flat, well defined; surface ornamented by a number of small costæ, augmenting here and there by bifurcation and intercalation at various intervals; apophysary system consisting of two short, central, diverging branches, bifurcated at their extremities; structure punctate; colour light yellow. Length 3, width 3, depth $1\frac{1}{2}$ line.

Hab. Sydney and New Zealand.

Obs.—This species is found near Sydney, living in company with *Ter. Australis*, as may be seen by the specimen in the British Museum; it is distinct from *K. pisum* and *K. Deshayesii*, by its somewhat tetragonal shape, stronger and fewer costæ, as well as by the details of its loop, relating it more than any of the other species of *Kraussia* to the section *Megerlia*; its colour is likewise of a uniform yellowish tint, while the above-mentioned species are differently tinged with red.

9. *KRAUSSIA DESHAYESII*, DAV. 1852. (Pl. XIV. fig. 20, 21.)

Terebratula Capensis, Adams and Reeve, Voyage of the Samarang, p. 70. pl. 21. f. 4, 1850 (non *T. Capensis*, Gmel.).

Diagnosis.—Shell subovate, generally rather longer than wide; valves nearly equally convex, a deep longitudinal depression extending from near the umbo to the front in the smaller valve, with a corresponding keel in the perforated one; beak produced, and truncated by a large emarginate foramen; deltidia small, nearly triangular, a portion of the circumference being completed by the umbo; surface ornamented by a great number of small raised costæ, augmenting rapidly by bifurcation and intercalation of smaller plaits at variable distances from the beak and umbo; structure punctate; colour light yellow, with stripes of red; apophysary system consisting of two short, central, diverging lamellæ expanded at their extremities. Length 6, width 4, depth 2 lines.

Hab. Korea. Coll. Cuming.

10. *ARGIOPE NEAPOLITANA*, Scacchi, sp. (Pl. XIV. fig. 24, 25.)*Terebratula Neapolitana*, Scacchi, Oss. Zool. ii. p. 18.*Terebratula seminumum*, Philippi, En. Moll. Siciliæ, 1836; Sow. Th. Conch. pl. 71. f. 85, 88.*Argiope Forbesii*, Dav. Ann. and Mag. of Nat. Hist. May 1852.

Diagnosis.—Shell small, suborbicular, nearly as long as wide, compressed, emarginated in front; valves unequal, slightly convex, almost smooth or ornamented by a few rounded and nearly obsolete radiating costæ; a longitudinal depression extending along the centre of the smaller valve; beak produced; foramen large, with a small, lateral, deltidial plate, and an area on either side; hinge-line straight; apophysary system consisting of a small longitudinal mesial septum, with a complete two-lobed loop; colour light yellow; structure largely punctate. Length $1\frac{1}{2}$, width $1\frac{1}{2}$, depth $\frac{1}{2}$ line.

Hab. Naples, and different parts of the Mediterranean, in from 60 to 105 fathoms (Forbes).

Obs.—Since the publication of my paper in the 'Annals,' May 1852, I have, through the kindness of Mr. Hanley, been enabled to examine two specimens, said to be the types of Scacchi's *Ter. Neapolitana*, and, according to Küster, the *Ter. seminumum* of Philippi would be a synonym; although the last-named author's species, from his illustration presenting a deep notch in the umbo (a character never seen in any *Argiope*), had led me erroneously to believe *T. seminumum* the same as Prof. Forbes's *T. appressa*. The figures of *Ter. Neapolitana* given both by Scacchi, Philippi, and Küster, do not represent the characters of the species under notice,—so much so that I believed it new, and gave to it the name of *Argiope Forbesii*, which must now be considered only a synonym: and Sowerby's figure correctly illustrates the species. In my plate I have also added a figure of the apophysary system of *A. decollata*, Chem. (fig. 26), and that of *T. Neapolitana* (fig. 25), to show the difference in the lobes of the loop in these two species; the arms in the first being four-lobed, whilst in the other recent forms, such as *Argiope Neapolitana* (fig. 25), *A. cistellula* (fig. 28), and *A. cuneata* (fig. 27), there exist only two lobes to the arms.

11. *RHYNCHONELLA NIGRICANS*, Sow. sp. 1846. (Pl. XIV. fig. 30, 31.)

Diagnosis.—Shell inequivalve, irregularly tetrahedral, wider than long; beak acute, and slightly recurved; foramen not entirely surrounded by the deltidial plates, a portion being completed by the umbo; beak-ridges well defined, leaving between them and the hinge-line a false area, not indenting much the smaller valve; surface ornamented by a variable number of sharp plaits, about twenty-five on each valve, a few of which are due to intercalation; mesial fold not prominent, but defined, with a corresponding shallow sinus in the larger valve; apophysary system consisting of two short curved lamellæ; colour bluish black; structure impunctate. Length 8, width 9, depth 4 lines.

No. CCXLIII. PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

Hab. Five miles east of Ruapuke Island, New Zealand; dredged by Mr. Evans, R.N., in 19 fathoms off coral and rock. Coll. Cum-
ming.

Obs.—When Sowerby described this interesting shell, only one small young specimen, without locality, was known; since then Mr. Evans has dredged several, some of which exceeded the dimensions above given. I therefore thought it advisable to redescribe and figure the species; more especially, as it is scarcely distinguishable from half-grown specimens of *R. concinna*, Sow.

12. ORBICULA EVANSII, Dav. 1852. (Pl. XIV. fig. 32–34.)

Diagnosis.—Shell irregularly circular, nearly as wide as long, very thick; both valves almost equally orbicular or suborbicular; apex subcentral; the unattached valve is ornamented by numerous strong, radiating, elevated striae, which augment rapidly by the intercalation of numerous smaller costae at variable distances from the apex; these are intersected by numerous concentric laminæ of growth; attached valve very deep; disk of adhesion small, almost central; fissure minute, elongated; surface covered by concentric raised laminæ, with longitudinal striae all round and near the edge; colour yellow; texture horny. Length $5\frac{1}{2}$, width 6, depth 4 lines.

Hab. Bodegas. Coll. Cumming.

Obs.—Mr. Cumming has three specimens of this *Orbicula*, all similar in appearance, and distinguishable from *O. Cumingii* and *O. strigata* by the great convexity of the attached valve, which is flat in the two above-mentioned species; the disk of adhesion is likewise much smaller in *O. Evansii*, and the striation stronger.

EXPLANATION OF THE PLATE.

- Fig. 1, 2. *Terebratula Grayii*, Dav.; natural size.
- Fig. 3. *Terebratula Grayii*, Dav.; interior of smaller valve.
- Fig. 4, 5. *Terebratella Bouchardii*, Dav.; natural size.
- Fig. 6. *Terebratella Bouchardii*, Dav.; interior of smaller valve.
- Fig. 7. *Terebratella Evansii*, Dav.; enlarged.
- Fig. 8, 9. *Terebratella Evansii*, Dav.; interior of smaller valve.
- Fig. 10–12. *Terebratella* ? *Cumingii*, Dav.; enlarged.
- Fig. 13. *Terebratella Cumingii*, Dav.; back of the beak, showing the foramen.
- Fig. 14. *Terebratella Cumingii*, Dav.; interior of smaller valve.
- Fig. 15. *Terebratella Cumingii*, Dav.; section of the interior of both valves, showing the position of the septum.
- Fig. 16. *Terebratella Cumingii*, Dav.; interior of smaller valve, much enlarged, showing the fringed arms: A, A, the cardinal muscles; B, the adductor ones; C, the pedicle muscles.
- Fig. 17–19. *Terebratulina Cumingii*, Dav.; enlarged.
- Fig. 20, 21. *Kraussia Deshayesii*, Dav.; enlarged.
- Fig. 22, 23. *Kraussia Lamarckiana*, Dav.; enlarged.
- Fig. 24. *Argiope Neapolitana*, Scacchi; enlarged.
- Fig. 25. *Argiope Neapolitana*, Scacchi; showing the two-lobed loop.
- Fig. 26. *Argiope decollata*, Chem.; interior of smaller valve, enlarged to show the four-lobed disposition of the loop.
- Fig. 27. *Argiope cuneata*, Risso; greatly enlarged, showing the interior as seen in the dried specimens: D, the mouth, fringed arms and two-lobed

loop; C, the pedicle muscles; B, the adductor ones; A, the cardinal muscles.

Fig. 28. *Argiope cistellula*, Wood; interior of both valves as seen in dried specimens (much enlarged); A, the retractor and pedicle muscles. The position of the arms and mouth is the same as in *A. cuneata*, &c.

Fig. 29. *Morrisia anomoides* (Scacchi, sp.); enlarged: o, the ovaries seen through the transparency of the shell.

Fig. 30, 31. *Rhynchonella nigricans*, Sow. sp.; natural size.

Fig. 32-34. *Orbicula Evansii*, Dav.; enlarged.

2. DESCRIPTIONS OF EIGHTEEN NEW SPECIES OF LAND SHELLS, FROM THE COLLECTION OF H. CUMING, ESQ.

By DR. L. PFEIFFER.

1. **HELIX AVUS**, Pfr. *H. testâ umbilicatâ, depressâ, solidâ, oblique striatâ, nitidâ, pallide fulvâ; spirâ convexâ, brevî; suturâ levi; anfractibus 4 vix convexiusculis, sensim accrescentibus, ultimo carinato, utrinque convexiore, fascia fusca ad suturam, pallidaque ad carinam ornato, basi pallido, circa umbilicum mediocrem, pervium subcompresso; aperturâ vix obliquâ, subtriangulâ-lunari; peristomate crasso, albo, expanso et reflexo, marginibus remotis, callo crasso junctis.*

Diam. maj. 37, min. 31, alt. 18 mill.

Hab. in insulis Philippinis.

2. **HELIX EMILIANA**, Pfr. *H. testâ perforatâ, conoideo-lenticulari, solidâ, supernè confertim costulatâ, lineis impressis spiralibus subregulariter granulatâ, opacâ, lutescenti-fusâ; spirâ conoidâ, vertice elevato, obtusiusculo; anfractibus 6 convexiusculis, lente accrescentibus, ultimo non descendente, compressè carinato, basi convexo, radiatim striatulo, nitidulo; aperturâ obliquâ, angulatâ-lunari; peristomate simplice, recto, margine columellari ad perforationem reflexiusculo.*

Diam. maj. 16, min. 15, alt. 8 mill.

Hab. in insula Ceylon.

3. **HELIX REDFIELDI**, Pfr. *H. testâ umbilicatâ, conoideo-globosâ, tenui, irregulariter striatâ et obsolete dissimilè decussatâ, diaphanâ, nitidâ, fulvo-cornâ; spirâ conoidâ, obtusâ; anfractibus 5½ convexis, regulariter accrescentibus, ultimo inflato, non descendente; aperturâ parum obliquâ, lunato-rotundatâ, altiore quam latâ, intus margaritacâ; peristomate simplice, recto, acuto, marginibus remotis, columellari subverticali, sursum dilatato, umbilicum angustum semitegente.*

Diam. maj. 17, min. 15, alt. 14 mill.

Hab. Shang Hai, Chinæ (Mr. Fortune).

4. **HELIX NUDA**, Pfr. *H. testâ vix perforatâ, conoideo-depressâ, tenui, radiatim striatâ, pellucidâ, pallide fulvo-cornâ; spirâ conoidâ, acutiusculâ; suturâ impressâ, albo-submarginatâ; anfractibus 6 convexiusculis, ultimo majore, inflato, non descen-*

dente; aperturâ ferè diagonali, rotundato-lunari, latiore quam altâ; peristomate simplice, recto, marginibus subconniventibus, dextro arcuatim antrorsum dilatato, columellari subrecedente, arcuato, supernè dilatato, reflexo.

Diam. maj. 11, min. 9½, alt. 7 mill.

Hab. in Himalayah (Mr. Fortune).

5. *HELIX MINERVA*, Pfr. *H. testâ umbilicatâ, sublenticulari, solidâ, subtiliter et confertim striatâ, carinatâ, nitidulâ, luted, fasciis 2 nigro-castaneis supra et infra carinam ornatâ; spirâ brevi, convexâ, obtusâ; suturâ lineari; anfractibus 4 sensim accrescentibus, vix convexiusculis, ultimo non descendente, basi, præsertim antice, convexo, circa umbilicum angustum, conicum, subcompresso; aperturâ diagonali, rotundato-lunari, intus submargaritacè; peristomate simplice, recto, marginibus remotis, supero antrorsum subarcuato, columellari subverticali, sursum dilatato, patente.*

Diam. maj. 25, min. 22½, alt. 12 mill.

Hab. in insulâ Celebes?

6. *HELIX REHBEINI*, Pfr. *H. testâ imperforatâ, globosâ, solidâ, minutissimè striatulâ, sub epidermide non nitente, virenti-luted albâ, plerumque fasciis saturatè castaneis pluribus latis cinctâ; spirâ conoideo-semiglobosâ, obtusulâ; anfractibus 4½ modicè convexa, rapidè crescentibus, ultimo rotundato, anticè breviter descendente, circa columellam vix declivem, latam, albam, subexcavatam nigricante; aperturâ diagonali, lunato-rotundatâ, intus albidâ; peristomate albo, expanso-reflexiusculo, intus subincrassato.*

Diam. maj. 27, min. 23, alt. 20 mill.

Hab. in insulis Philippinis.

7. *HELIX EVA*, Pfr. *H. testâ imperforatâ, trochiformi, solidâ, subtiliter et confertim striatâ, vix nitidulâ, carned, sursum fasciâ fusco-violacè ornatâ vel omnino fuscâ; spirâ conicâ, acutiusculâ; suturâ impressâ; anfractibus 5 vix convexis, ultimo non descendente, acutè carinato, basi convexiusculo, medio impresso; aperturâ perobliquâ, lunato-rhombè; peristomate fusco-limbato, marginibus subparallelis, supero expansiusculo, basali arcuato, medio angulum obsoletum formante, incrassato, breviter reflexo.*

Diam. maj. 14, min. 12, alt. 9 mill.

Hab. in insulis Novis Hebridibus.

8. *HELIX ISODON*, Pfr. *H. testâ angustè umbilicatâ, conoideo-lenticulari, solidâ, undique minutè granulatâ, castaneo-fuscâ; spirâ latè conoideâ, obtusulâ; anfractibus 5 vix convexiusculis, lentè accrescentibus, ultimo carinato, anticè perdeflexo, strangulato et scrobiculato, basi convexo; aperturâ ferè horizontali, auriformi; peristomate fusculo, subincrassato, reflexo, marginibus callo alte elevato flexuoso, medio laminam linguæ-*

formem emittente junctis, dextro valdè curvato, bidentato, basali declivi, unidentato, dentibus subæqualibus, validis.
 Diam. maj. 19, min. 17½, alt. 10½ mill.
Hab. in Columbiâ occidentali.

9. **BULIMUS JANUS**, Pfr. *B. testâ imperforatâ, dextrorsâ vel sinistrorsâ, subfusiformi-oblongâ, solidâ, vix nitidulâ, luteâ-fasciis 3 extus opace viridibus, intus nitide atro-castaneis, peristoma non attingentibus, basali latissimâ, varicibusque castaneis sparsis ornatâ; spirâ conicâ, acutiusculâ; anfractibus 6-7 convexiusculis, ultimo ¾ longitudinis subæquante, basi attenuato; columellâ verticali, strictâ; aperturâ obliquâ, semi-ovali, basi subangulatâ; peristomate subincrassato, breviter reflexo, albo, marginibus callo nigro-castaneo junctis.*
 Long. 47, diam. 20 mill.
Hab. in Novis Hebridibus.

10. **BULIMUS FULIGINEUS**, Pfr. *B. testâ imperforatâ, oblongâ, solidâ, longitudinaliter striatâ et concentricè irregulariter subsulcatâ, fuliginè; spirâ convexo-conicâ, obtusulâ; suturâ profundâ, pallidâ; anfractibus 5 modicè convexis, rapidè accrescentibus, ultimo ¾ longitudinis æquante, basi attenuato; columellâ carnèâ, subtortâ, basi subtruncatâ; aperturâ vix obliquâ, elongato-auriformi, intus lividâ; peristomate undique expansiusculo, margine dextro medio impresso, intus subdentato.*
 Long. 38, diam. 16 mill.
Hab. in Novis Hebridibus.

11. **BULIMUS BLANDI**, Pfr. *B. testâ perviè et angustè umbilicatâ, turritâ, tenuiusculâ, obliquè confertim filoso-striatâ, opacâ, calcared; spirâ elongatâ, infra apicem latum, obtusum attenuatâ; suturâ vix impressâ; anfractibus 17 planis, ultimo subangulato, ¾ longitudinis subæquante; aperturâ vix obliquâ, subtetragonâ; peristomate simplice, recto, margine columellari supernè reflexiusculo.*
 Long. 22, diam. 7 mill.
Hab. Baranguilla in Andibus Columbianis (Bland).

12. **PARTULA GLUTINOSA**, Pfr. *P. testâ subumbilicatâ, subpyramidatâ, solidâ, lævigatâ (sub lente vix decussatulâ), epidermide fulvâ, nitidâ, quasi glutinosâ obductâ; spirâ elevato-conicâ, apice acutâ; suturâ lævi; anfractibus 5, superis planis, ultimo spiram subæquante, convexiore, basi quasi saccato; columellâ leviter arcuatâ, supernè vix plicatâ; aperturâ ferè verticali, oblongâ, obliquè protractâ; peristomate lato, intus calloso, violaceo-fusco limbatò, marginibus subparallelis.*
 Long. 19, diam. 10 mill.
Hab. —?

13. **PARTULA DENTIFERA**, Pfr. *P. testâ subumbilicatâ, ovato-conicâ, solidâ, sublævigatâ, parum nitidâ, pallide stramineâ; spirâ conicâ, apice acutiusculâ; suturâ marginatâ; anfractibus*

5½, summis planis, penultimo convexiore, ultimo spirâ viz brevior, convexo, anticè medio impresso; columellâ subverticali, viz plicatâ; aperturâ viz obliquâ, angustâ, obversè auriformi; peristomate valdè incrassato, albo, patente, marginibus subparallelis, dextro supernè valdè curvato, medio tuberculum acutum, dentiforme gerente.

Long. 21½, diam. 10 mill.

Hab. —?

14. *ACHATINA IOSTOMA*, Pfr. *A. testâ fusiformi-ovatâ, tenui, undique æqualiter granulatâ, parum nitidâ, fulvâ, strigis obscuris, latis, subangulatis, castaneis ornatâ; spirâ conicâ, supernè attenuatâ, pallidâ, apice obtusâ; suturâ subcrenatâ; anfractibus 7½ viz convexiusculis, ultimo spiram paulò superante, basi subattenuatâ; columellâ leviter tortâ, basi obliquè et breviter truncatâ; aperturâ verticali, angustè semiovali, intus pallide lilacind, nitidâ; peristomate simplice, margine dextro regulariter arcuato.*

Long. 128, diam. 56 mill.

Hab. Fernando Po (*Fraser*).

15. *ACHATINA GLUTINOSA*, Pfr. *A. testâ ovato-conicâ, tenuiusculâ, longitudinaliter striatâ, subunicolore fulvâ; spirâ conicâ, sursum attenuatâ, apice obtusiusculâ; anfractibus 7½, mediis lineis spiralibus subdecussatis, ad suturam submarginatam profundè striatis, ultimo spiram paulò superante, sublævigato, glutinoso-nitente; columellâ plicato-tortâ, basi abruptè truncatâ; aperturâ obliquâ, ferè ovali, intus lilaced, margaritacè; peristomate simplice, fusco-limbato, margine basali arcuato.*

Long. 98, diam. 45 mill.

Hab. in Africâ occidentali (*Fraser*).

16. *ACHATINA DESHAYESI*, Pfr. *A. testâ turrilo-ovatâ, tenuiusculâ, sublævigatâ, nitidâ, corneo-fuscâ; spirâ elongatâ, convexâ, apice obtusâ; suturâ simplice, subprofundâ; anfractibus 7 convexis, ultimo ½ longitudinis subæquante, basi rotundato; columellâ subtortâ, latè et obliquè truncatâ; aperturâ viz obliquâ, rhombo-semiovali; peristomate simplice, obtuso, margine dextro subrependo.*

Long. 11, diam. 5 mill.

Hab. in insulâ Ceylon.

17. *ACHATINA CEREÆ*, Pfr. *A. testâ oblongo-turritâ, tenui, subtiliter et regulariter striatâ, nitidâ, pellucidâ, pallide ceræ; spirâ rectilineari, apice obtusâ; suturâ mediocri, minutè crenulatâ; anfractibus 8 viz convexis, ultimo ½ longitudinis viz superante, infra medium subangulato; columellâ curvatâ, abruptè truncatâ; aperturâ obliquâ, oblongâ; peristomate simplice, recto, margine dextro leviter arcuato.*

Long. 14, diam. 4½ mill.

Hab. Fernando Po (*Fraser*).

18. *HELICINA SUBLÆVIGATA*, Pfr. *H. testâ conoideo-depressa, solidula, sublævigata, nitidula, unicolore rubella vel albida, subtus violaceo zonata; spirâ breviter conoidea, vertice obtusula; anfractibus 5 vix convexiusculis, ultimo latiore, peripheriâ obsolete angulato; aperturâ diagonali, subsemiovali; columellâ brevi, simplice, callum crassiusculum, circumscriptum retrorsum emittente; peristomate simplice, breviter expanso, margine basali ferè rectilineari, ad columellam subdentato. Operculum tenue, corneum.*

Diam. maj. 8, min. 6½ alt. 5 mill.

Hab. in Novis Hebridibus.

3. NOTES ON THE *DIDUNCULUS*, A SPECIES OF PIGEON SUPPOSED TO BE PECULIAR TO THE NAVIGATOR'S ISLANDS. BY LIEUT. THE HON. F. WALPOLE, R.N. COMMUNICATED BY J. H. GURNEY, ESQ., F.Z.S.

May 25.

Lieut. Walpole always saw this bird (when in its natural state) either perching on trees or flying about them,—feeding by day and roosting by night among the branches. He never saw them on the ground, though he has seen places where they appeared to have been scratching, either for roots or for other food. The crops of the specimens which he examined were, however, generally filled with green berries, which grew in clusters on a species of ash. The number of specimens so examined was considerable, as the birds formed Lieut. Walpole's principal food while on these islands. He found the flesh most excellent, though in colour darker even than that of the English wood-pigeon. The flight of the *Didunculus* is mostly limited to a transit from wood to wood, as they rarely attempt to pass from one island to another,—the distance between the islands varying from ten to eighty nautical miles.

Though their flight appears to be inferior to that of most pigeons, it is of the same swooping and continuous character.

They retire late to roost, but are not nocturnal.

They are generally seen either in pairs or in small flocks. The largest flock seen by Lieut. Walpole consisted of nine.

In the breeding season they pair and retire to the interior of the islands, where they nest amongst the rocks.

Lieut. Walpole does not know the colour or number of the eggs, but states that the young are naked and helpless.

The male bird is superior to the female in size, colour, and carriage, but does not attain his full plumage until the second year.

The natives of the Samoan Islands are fond of keeping the *Didunculus* tame as pets, either taking them from the nest, or, when older, with bird-lime.

They attach the bird by a long string fastened round one leg to a stick about two feet in length, with a fork at the end, which is stuck generally in the wall inside the hut, but sometimes in the ground outside.

The natives, when they walk, often carry with them these sticks with the birds attached, and train the birds to leave the stick occasionally and hover above it till it is again presented for the bird to perch on,—the line by which it is attached being long enough to admit of this operation.

June 8, 1852.

G. R. Waterhouse, Esq. in the Chair.

The following paper was read :—

ON THE CLASSIFICATION OF THE STRIGIDÆ. BY DR. KAUP.

This paper will appear in the Transactions of the Society.

July 27, 1852.

G. R. Waterhouse, Esq., in the Chair.

The following papers were read :—

1. NOTE ON THE INDIAN WEAVER-BIRD (*POLOCEUS PHILIPPENSIS*).
BY LIEUT. BURGESS.

The dimensions of the male are as follows :—Length $6\frac{1}{2}$ inches ; from the carpal joint to the end of the longest quill-feather, $2\frac{3}{4}$ inches. Irides dark brown ; beak bluish black ; base of the lower mandible dull yellow on the underside ; legs, feet and claws pale flesh-coloured brown.

Length $6\frac{1}{2}$ inches ; from the carpal joint to the end of the longest quill-feather, $2\frac{3}{4}$ inches. Beak yellowish horn colour ; base of both mandibles, especially that of the lower, dull brownish orange ; legs, feet and claws as in the male.

These pretty little birds are sociable in their habits, building several nests on the same tree. The nests are of beautiful construction, shaped like a ball, with a long pendent tube. They are generally formed of a species of strong wiry grass, but in places where the date-palm grows, they are made with fine fibres, split by these little architects out of the small spiked side-leaflets of the branches. Both male and female work, though the male appears to prefer looking on and squabbling with his neighbours to building. When a blade of grass or fibre has been brought to the nest, considerable time is required to work it into the growing fabric, the builder weaving both

on the outside and inside. The entrance tube is a most beautiful piece of workmanship, and in many nests is nearly a foot long. When these birds commence building, they almost invariably fix upon a thorny tree, or one growing over a stream or old well. In places where date trees are growing on the banks of a stream they appear to prefer them, but I do not recollect having seen nests away from water. Having selected their situation, they begin by weaving a stem of grass or fibre of date leaf, attaching to it a ring of the same materials; on one side of this ring is worked the body of the nest, on the other the entrance tube. A very slender drooping bough is generally selected; the upper portion of the ball of the nest, as it is being worked, is strengthened with lumps of mud.

In one or two instances I have seen an upper room over the nest, between it and the bough. This appears to be the abode of the male. On one occasion, when watching a colony of these birds building, I observed a nest with an upper story, in which the male was lazily sitting whilst the female was working at the room below; and the natives who assisted me in getting some of the nests assured me that the upper is the male's abode. The upper room is made by widening the stem of the nest, and adding a penthouse to it. When the nest is finished, which takes place about the middle of August (the height of the monsoon), the eggs, six or eight in number and of a pure white, are laid. During the breeding season the male employs himself alternately in helping his mate and fighting with all others of his kind that approach his nest. His song, often repeated, is simple and very sweet.

It is a very curious fact, that out of some fifty nests not more than one or two have the upper room attached. If this penthouse is put up to keep off the monsoon rains, why should so few males have them?

The claws of these birds are remarkably long, enabling them to hang securely to their nests when building them. Their food consists of seeds. In the month of April I shot two or three in the hedge round a stackyard. They were males, in the same plumage as the adult female. The adult male loses, I believe, his bright golden plumage after the breeding season.

2. ON THE HABITS OF THE MUNGOOS (*HERPESTES GRISEUS*). By LIEUT. PEGUS.

In this communication the author gives an account of a combat which he witnessed at Pondicherry, between a Mungoos and a Cobra (*Naia tripudians*). The snake was brought in a trap to the Travellers' Bungalow, which is enclosed by stone walls, and on being liberated and seeing the Mungoos it endeavoured to make its escape. The latter, however, attacked it immediately with much fury, and a battle ensued, which lasted about five minutes, when the snake was observed to dart upon its assailant and wound it with its fangs.

The Mungoos on this rolled over and lay for some little time as if

dead, with a black foam at its mouth; it then suddenly started up and darted off into the bush. In about twenty minutes it returned, when the mouth was observed to be marked with green from some herb it had been eating. It appeared quite recovered, and immediately attacked the snake with even more fury than before. This combat lasted about six minutes, when the Mungoos got the snake by the neck, killed it, and severed its head from its body. The snake was upwards of five feet long.

3. DESCRIPTIONS OF NEW SHELLS, FROM THE CUMINGIAN COLLECTION. BY ARTHUR ADAMS, F.L.S. ETC.

(Mollusca, Pl. XV. XVI.)

1. MYOCHAMA STUTCHBURYI, A. Adams (Pl. XV. fig. 4). *M. testa inæquivalvi, subæquilaterali, rosea; valva dextra affixa, sinistra convexiuscula, apice acuto, antice recurvo, longitudinaliter costata, transverse oblique plicata; costis squammulato-nodosis; latere antico rotundato, postico oblique truncato.*

Hab. Australia.

This species, named in honour of the founder of the genus, differs from the type *M. anomioides* in being longitudinally ribbed radiately from the apex, and in the apex of the umbones being sharp, produced, and flattened.

2. MYOCHAMA KEPPELLIANA, A. Adams (Pl. XV. fig. 1). *M. testa inæquivalvi, æquilaterali, carnea; valva dextra affixa, sinistra convexa, apice producto, acuto, inflexo, longitudinaliter radiatim costata; costis nonnullis dichotomis, squammulis rotundatis, arcuatis, confertis, ornatis; latere postico oblique truncato, antico rotundato.*

Hab. Bass's Straits, deep water.

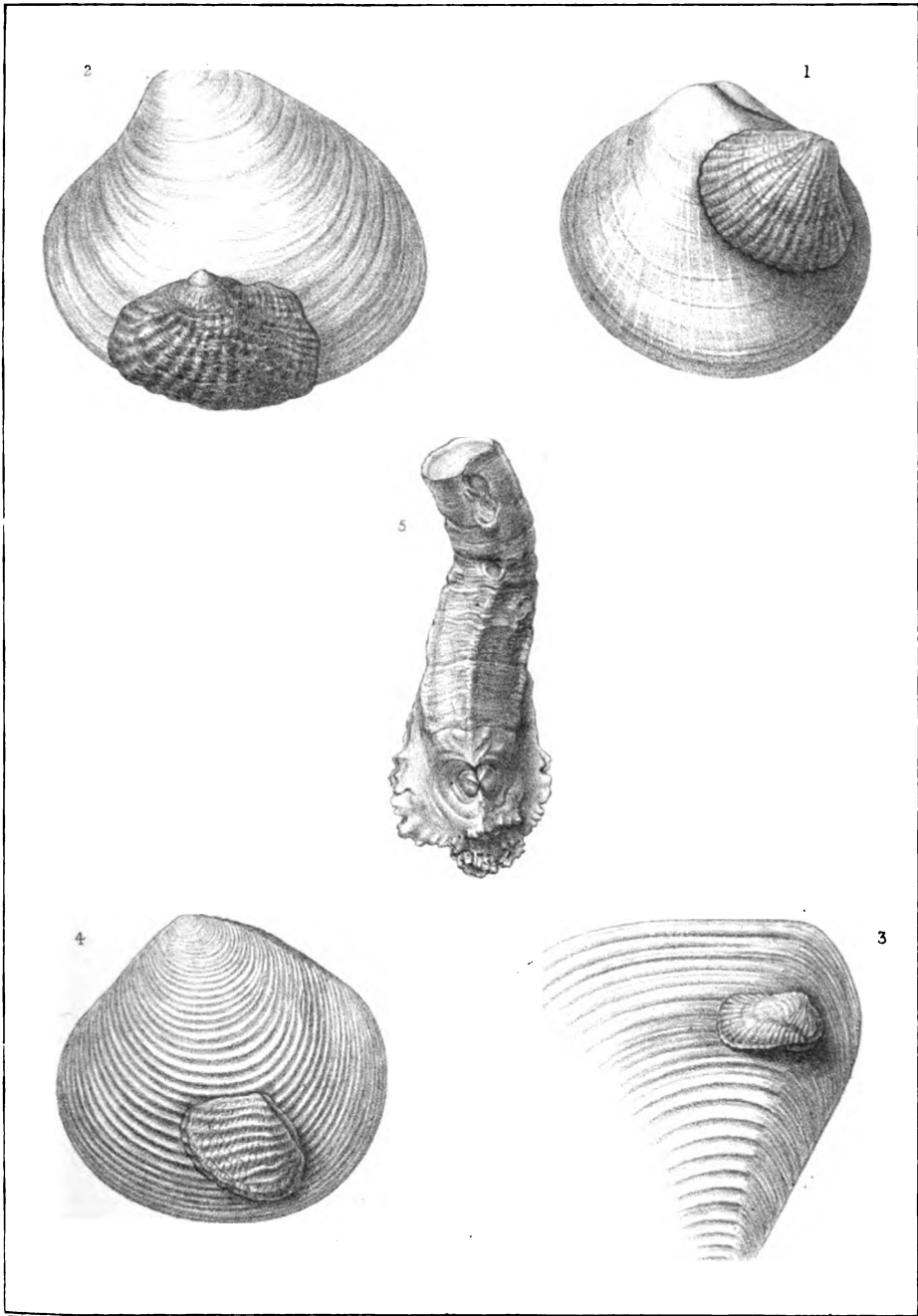
This species, found by the Hon. Captain Keppell, differs from the type in the ribs radiating regularly from the apex and not being nodosely wrinkled, but furnished with regular rounded arcuated scaly tubercles.

3. CRASSATELLA OBESA, A. Adams (Pl. XVI. fig. 2). *C. testa æquivalvi, inæquilaterali, crassa, gibbosa, epidermide rufo-fusca sericea obteeta, transverse valde plicata, plicis prominentibus, ad marginem ventralem evanidis; lunula impressa lanceolata; latere postico subproducto, angulato, margine truncato; latere antico gibboso, margine rotundato.*

Hab. New Zealand, deep water (Mr. Strange).

This species somewhat resembles *C. lapidea*, Reeve, but it is not rayed, nor beaked so strongly posteriorly, and the valves are much more gibbous and very strongly transversely plicate.

4. CRASSATELLA CUMINGII, A. Adams (Pl. XVI. fig. 1). *C. testa æquivalvi, inæquilaterali, subtrigonalì, epidermide fusca radiatim striata obteeta, transverse concentrice valde plicata,*



W E Baily.

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Fig. 1. *Myochama Keppelliana* A Adams
 2. " *Strangei* " "
 3. " *transversa* " "
 4. " *Stutchburyi* " "
 5. *Aspergillum Strangii* " "

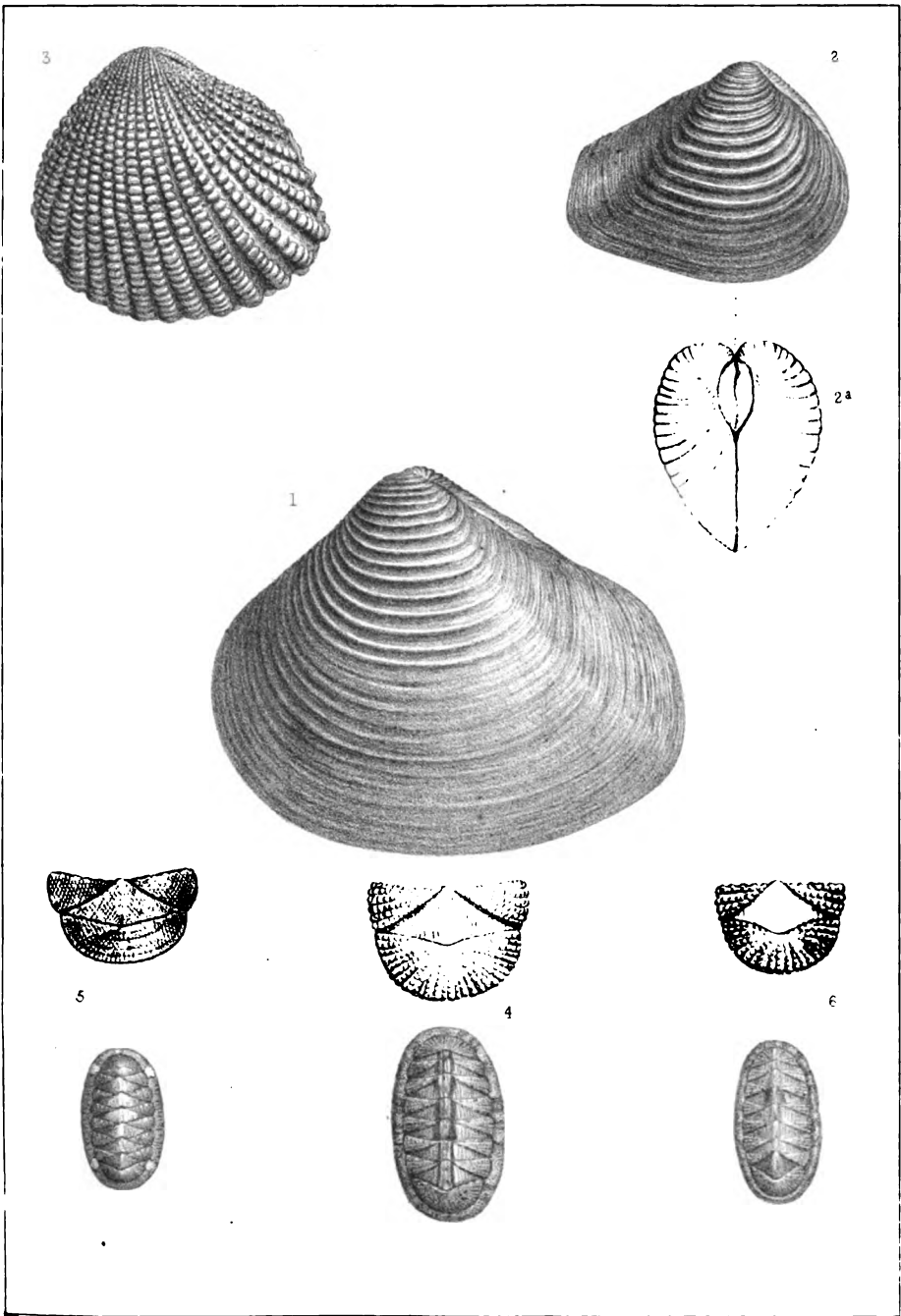


Fig. 1. *Crassatella Cumingii*. A Adams
 2. " *obesa* " "
 3. *Trigonia Strangei* " "
 4. *Chiton insculptus* " "
 5. " *versicolor* " "
 6. " *muricatus* " "

plis crassis, elevatis, ad marginem ventralem evanidis; latere antico rotundato, postico subrostrato, margine oblique truncato.

Hab. Moreton Bay, East Australia, deep water (*Mr. Strange*).

This large species is near *C. pulchra*, Reeve, but differs in being more gibbose, less beaked posteriorly, in the plicæ being stronger, and in wanting the coloured rays.

5. *ASPERGILLUM STRANGEI*, A. Adams (Pl. XV. fig. 5). *A. testa æquivalvi, subæquilaterali, alba, transversim sulcosa, umbonibus prominulis. Tubo inferne clauso, disco terminali basi adhærente, adlatera expansiusculo, margine tubulis minimis ornato, postice subcarinato, producto, tubulis curtis instructo; superne elongato, tortuoso, carinis obtusis quatuor longitudinalibus, ornato, margine simplice recto.*

Hab. Seas of Australia (*Mr. Strange*).

Two specimens of this curious form were collected, one attached to a stone, and the other to the valve of a *Mytilus*. They were found at Sydney, in shoal water. The fact of the tube being nothing more than the valves greatly expanded and modified, is well shown in one of the specimens.

6. *TRIGONIA STRANGEI*, A. Adams (Pl. XVI. fig. 3). *T. testa æquivalvi, inæquilaterali, subtrigona, fusca, longitudinaliter valde costata; costis antice confertis, postice magis distantibus, squamis nodiformibus, transversis, imbricatis, confertis, ornatis; interstitiis transverse crebre striatis; latere antico rotundato, postico oblique subtruncato.*

Hab. Sydney, deep water (*Mr. Strange*).

This species is larger than *T. margaritacea*, and somewhat resembles in the style of sculpture *T. uniophora*, Gray. The form of the scales on the ribs at once distinguishes it, however; the shape of the shell, especially the outline of the hind slope, is also very different.

7. *CHITON INSCULPTUS*, A. Adams (Pl. XVI. fig. 4). *C. testa oblonga, valde elevata, valvis terminalibus cæterarumque areis lateralibus radiatim costatis, costis granatis, granis transversis, subconfertis, ad marginem obsolete; umbonibus carinatis; valva terminali antice umbonata; areis centralibus longitudinaliter valde liris; liris obsolete rugoso-granulatis. Coccineus areis centralibus lineis nigro-fuscis duabus ornatis; ligamento luteo-fusco fuscoque articulado squammulato, squammulis lævis, nitidis, convexis.*

Hab. New Zealand, on dead shells, deep water (*Mr. Strange*).

A beautifully sculptured species of a red colour, with two dark parallel lines down the centre of the valves.

8. *CHITON MURICATUS*, A. Adams (Pl. XVI. fig. 6). *C. testa oblonga, in medio valde elevata, nigro-fusco alboque variegata, valvis terminalibus cæterarumque areis lateralibus radiatim costatis; costis granis elevatis acutis ornatis; valva ter-*

minali in medio umbonata; areis centralibus longitudinaliter valde liris, umbonibus lævibus, elevatis, subproductis; ligamento squammulato; squammulis mucronatis, imbricatis, apicibus suberectis.

Hab. Sydney, under stones, low water (*Mr. Strange*).

This species is remarkable for the somewhat triangular imbricate scales of the ligament ending in sharp pointed mucrones; the ligament is tessellated with pale fuscous and dark brown; the ribs on the lateral areas are four, muricated with sharp granules.

9. *CHITON VERSICOLOR*, A. Adams (Pl. XVI. fig. 5). *C. testa oblongo-ovali, elevatiuscula, rufo, albo, fuscoque varie picta; valvis obtusis, in medio longitudinaliter sulcosi, umbonibus acutis substratis, apicibus deflexis; valva terminali in medio umbonata; ligamento tenuiter granoso-coriaceo rufo-fusco, maculis albis quinque ornato.*

Hab. Sydney, under stones, low water (*Mr. Strange*).

A prettily variegated species, with the scales on the ligament minute, imbedded and not imbricate, and the entire upper surface of the valves delicately shagreened.

November 9, 1852.

J. S. Bowerbank, Esq., F.R.S., in the Chair.

The following papers were read:—

1. DESCRIPTIONS OF A NEW GENUS, AND OF SEVERAL NEW SPECIES, OF MOLLUSCA, FROM THE CUMINGIAN COLLECTION.

BY ARTHUR ADAMS, F.L.S. ETC.

Family SOLENELLIDÆ.

Animal oblong. Mantle open in the entire length; margin double, outer edge fimbriated; hind outer edge ending in two callosous conical processes immediately below the respiratory orifice. Respiratory orifice continuous with the opening of the mantle, the margin fringed; anal siphon simple-edged, tubular, elongate, muscular, produced beyond the fringed mantle-margin which surrounds its base. Gill single on each side, attached the whole length. Labial palps elongate, fringed at their margins, and surrounded at their base by a thin dilated membrane. Foot large, compressed, geniculate, ending anteriorly in a folded ovate disc with crenate margins.

Shell thin, not pearly within. Hinge-margin with comb-like teeth. Ligament external.

Genus NEILO, A. Adams.

Testa transversa æquivalvis, inæquilateralis, epidermide fusco tenui induta, latere postico hians. Dentibus cardinalibus, nullis, lateribus anticis et posticis plurimis in serie rectiuscula dispositis; dentibus parvis acutis; impressionibus muscularibus subdistantibus, impressione pallii sinu magno; ligamento externo elongato.

This genus differs from *Solenella*, not only in its *Leda*-like form, but in the hinge-margin having as many teeth anteriorly as posteriorly. In *Solenella* the series of teeth is confined to the fulcrum to which the external ligament is attached;—in this genus the teeth extend along the entire hinge-margin.

NEILO CUMINGII, A. Adams. *N. testa transversa, æquivalvi inæquilateralis, epidermide tenui viridi-fusco oblecta, transverse concentricæ sulcata; latere antica clauso, rotundato, postico, longiore, subangulato, hiant, margine truncato flexuoso, superne auriculato.*

From the circumstance of the hind margin gaping considerably and being divided as if for two siphons, the anal and branchial tubes in this animal are probably distinct and elongated, as in *Leda*. The genus *Neilo*, in fact, will represent *Leda*, of the family *Nuculidæ*, in a distinct family, *Solenellidæ*, characterized by the external ligament of the hinge. It is from the shores of New Zealand.

CONCHOLEPAS (CORALLIOBIA) FIMBRIATA, A. Adams. *C. testa ovata alba, longitudinaliter radiatim costata, transverse lamellosa, lamellis pulcherrime fimbriatis; spira minuta, anfractu ultimo amplo; apertura ovali antice attenuata, subcanaliculata; labio excavato incurvato, margine externo dilatato et valde reflexo; labro acuto, margine late dilatato et eleganter fimbriato.*

Hab. Cagayan, province of Misamis, island of Mindanao, Philippines. On the coral reefs at low water (*H. C.*). Mus. Cuming.

Externally this curious shell resembles *Concholepas*, but the absence of the two teeth on the fore part of the outer lip prevents it being strictly referred to that genus. In the character of the inner lip, and in its place of habitation on coral reefs, it approaches *Leptconchus*, and perhaps it has affinities also with *Pedicularia*. I have thought it best, until the animal is known, to regard it as a subgenus of *Concholepas*, under the name of *Coralliobia*.

PAXILLUS MINOR, A. Adams. *P. testa dextrorsa, ovali, tenui, epidermide fusca oblecta; anfractibus septem convexis, longitudinaliter confertim costellatis vel valde striatis; apertura suborbiculari, ascendente, antice subproducta; peristomate duplici, externo reflexo, dilatato; labio plica dentiformi valida instructo.*

Hab. — ?

I believe the little shell described above to be a dextral species of

the genus *Paxillus*, described by my brother and myself in the 'Annals' a few months ago. We there considered the genus to belong, possibly to *Auriculidæ*; but an examination of this species, and a better knowledge of the locality where the shells have been found, lead us to place them amongst the *Helicidæ*.

DIPLOMMATINA BENSONI, A. Adams. *D. testa minima vix rimata sinistrorsa, cylindrico-ovata, costellata, costulis distantibus obliquis regularibus; anfractibus sex, convexis, apice subobtusos; apertura rotundata; peristomate duplicato, externo expanso reflexo, interno recto, margine flexuoso.*

Hab. On the banks of a river, Moreton Bay, E. Australia (*Mr. Strange*).

This very pretty little shell agrees in all its characters with the genus *Diplommatina* of Mr. Benson, after whom I have named it. There is some difficulty in the location of this genus. Mr. Benson says distinctly that the eyes are "on the posterior part of the tentacula, at their base," but he says there is no operculum. Mr. Gray, on the other hand, has described the operculum. The true position is probably in *Truncatellidæ*.

CRASSATELLA SPECIOSA, A. Adams. *C. testa transverse ovata subæquilaterali, pallida, epidermide tenui fusca induta, concentricè plicata; plicis confertis regularibus; latere postico rotundato, antico acuminato subrostrato, angulato, margine ventrali convexo, antice sinuato.*

Hab. Bay of Campeachy. Mus. Cuming.

The beaks in this species are acute and close together, and rather more deeply plicate than the rest of the surface of the valves; there is an obtuse oblique and angular ridge extending from the umbones to the ventral margin.

CRASSATELLA LÆVIS, A. Adams. *C. testa ovato-transversa crassa, tumida, subæquilaterali, castanea, lævigata, concentricè striata, natibus subsulcatis; latere postico rotundato, antico producto subrostrato, margine oblique truncato, carina obtusa a natibus ad basin decurrente instructo, posteriori sulcato, margine ventrali convexo antice sinuato.*

Hab. La Guayra (*M. Le Marie, French Navy*). Mus. Cuming.

A large smooth pale chestnut shell beaked anteriorly and with a prominent obtuse keel extending from the beaks to the fore part of the ventral margin, and a broad shallow groove behind it; the lunule is ovate lanceolate, and the beaks are transversely sulcate.

CRASSATELLA OBSCURA, A. Adams. *C. testa ovato-trigonalis, transversa, subæquilaterali, compressa, nigro-fusca, apicibus transverse corrugata, ad umbonem plicata; latere antico rotundato, postico subtruncato; margine valvarum intus crenulato.*

Hab. China Seas, deep water. Mus. Cuming.

A small brown-black species, with the valves only plicate near the beaks and their inner margins finely crenulated.

CRASSATELLA BELLULA, A. Adams. *C. testa ovato-trigonalis, subæquilaterali, carneo-fulva, immaculata, transverse concentricè plicata; plicis obtusis subconfertis regularibus, antice undulatis, subevanidis (sub lente rugulosis); latere postico rotundato, antico vix truncato; umbonibus acutis parvis approximatis.*

Hab. New Zealand (Mr. Hart). Mus. Cuming.

A beautiful pinkish yellow species, without any spots or markings, with the plicæ on the fore part undulated and rugulose under the lens.

CRASSATELLA TRUNCATA, A. Adams. *C. testa ovata, compressa, carnea, pallidiori ad partem anticam, radiis angustis inconspicuis ornata, inæquilaterali, latere antico breviori et rotundato, postico dilatato et truncato, linea elevata e umbonibus ad marginem ventralem; transversim valde costata, costis acutis subimbricatis.*

Hab. China Sea, deep water (A. Adams).

This is a small pale pink or flesh-coloured species, strongly ribbed, the ribs being sharp, prominent and imbricated; the posterior side is dilated and truncate, and the surface of the valves is marked with faint linear radiating lines.

CRASSATELLA COMPTA, A. Adams. *C. testa ovato-trigonalis, subæquilaterali, apicibus antrorsum curvatis, rufescenti, transverse concentricè plicata; plicis validis, regularibus subdistantibus; latere antico angustiori, postico latiori rotundato, interne purpurascente.*

Hab. China Sea, deep water (A. Adams).

This is a small red species, with prominent curved beaks, strongly plicate transversely, and of a purplish pink colour in the interior of the valves.

CRASSATELLA CONCINNA, A. Adams. *C. testa ovato-transversa subæquilaterali, epidermide tenui fusca oblecta, utrinque rotundata, concentricè plicata, plicis validis regularibus rufofusco articulatis; interstitiis creberrime longitudinaliter striatis; umbonibus acutis confertis.*

Hab. China Sea, deep water (A. Adams).

A small fuscous species, of an ovate form, rounded at both ends, with the transverse plicæ strongly produced and prettily articulated with brownish red.

November 23, 1852.

Dr. Gray, F.R.S., Vice-President, in the Chair.

The following papers were read :—

1. NOTE ON THE GOUWA (*BOS FRONTALIS*) OF WESTERN INDIA,
CALLED "THE BISON" BY ENGLISH RESIDENTS.
BY CAPT. J. WYCLIFFE THOMPSON.

Eliot Vale, Blackheath, Kent.
20th Nov. 1852.

THE size of the beast I cannot state with any exactness, having had no means of judging beyond forming an estimate by the eye of the carcase as it lay on the ground before me. The common report amongst Indian sportsmen is, that the old bull stands 19 hands (6 feet 4 inches) at the shoulder. Upon what grounds this estimate rests I cannot say, but it is in some degree confirmed by my own impression, that an old bull was pretty nearly equal in height and bulk to one of the very largest of the London Dray-horses. The colour is chocolate-brown, deepening in shade on the belly; the lower part of the leg is of a dirty yellow-brownish white from the foot upwards to a little above the knee in the fore and the hock in the hind leg, the line of demarcation between the white and the chocolate being abrupt, as in a 'white-stockinged' horse. The profile of the face is decidedly curved, the part of the forehead between the horns is excessively raised in a kind of ridge, of which traces are to be seen in the skulls, though in these it is much less strongly marked than in the live animal. The shoulder is raised, not in a hump like that of the Brahminee bull or common Indian ox, but in a kind of ridge, giving the idea that the spine, beginning at the shoulder, had been unnaturally raised, and carried at that elevation some way to the rear, and then allowed suddenly to drop into the ordinary level of the back. The forehead, including the high ridge between the horns, inclines to ash-colour; the tail is small and short.

The only part of the country in which I have met with these animals is on the "Suhyadri" mountains or "Western Ghauts," a narrow belt of wild, broken, and thickly-wooded country dividing the high lands of the Deccan or Maratha country from the low land of the Concan or country bordering the margin of the sea. This Ghaut country is of most peculiar appearance: anything that can be called a *plain* does not exist in it; it is a succession of the most rugged hills and of the most wild, deep ravines; the whole, with the exception of here and there a bare ridge of hill, covered with a dense mass of bushes, brushwood, tall ferns and flowering plants, so thick that it is frequently necessary to clear a road with bill-hooks; imbedded in this mass of vegetation lie broken crags of brown rock; above all this rise clumps of forest trees, and above these again rises some rugged hill-side crowned by a bare perpendicular scarp of black rock.

This line of country, which in every part that I have visited forms a line of demarcation between the Concan and the Deccan, and consequently stretches in point of length over a wide extent, is in point of breadth inconsiderable, occupying no larger space than must necessarily be covered by a mountain range with broken and irregular spurs. As you will perceive from my description, it is a country which one would scarcely think adapted to huge cattle like the Bison, but they *do* inhabit it, and hold to it most rigorously, as I never saw or heard of one either in the Concan or the Deccan. Occasionally they make their appearance on the borders of this country, and do great damage to the small fields of corn which the natives cultivate on the very verge of the forest; choosing, as I gather from the natives, the night for their operations; but their usual abode is in the depths of the Ghaut country, as not only are they invariably, when sought for by sportsmen, found in the very depth of the thick forest, but constant traces of them may there be met with; as for instance, crossing a little open glade in the forest, covered, as is sometimes the case, with nothing but a long thin dry grass, it is not unusual to see half a dozen patches where the squashed and flattened grass shows where the Bison has been sleeping; and the natives frequently point out a bed of a greener and more delicate kind of grass, and show where it has been cropped by the grazing Bison.

The usual method of hunting these beasts is to take up a post commanding some narrow pass, and throwing from fifty to a hundred beaters into the forest, to form them into a *cordon*, which driving the Bison before it, contracts as it approaches the pass and forces them through it under the fire of the hunters. The Bison, when stirred but not as yet much alarmed by the distant line of beaters, are usually seen plodding along with a slow heavy gait, and with their heads carried low. When under these circumstances I have been able to obtain a clear view of them, they have struck me by a resemblance in general figure to the North American Bison, of which I have seen specimens in England: they have a heavy, compact, short-necked, thick-headed look, which distinguishes them most strongly from the long-faced dolorous-visaged tame buffalo of India. When disturbed by the closer approach of the beaters, they break into a heavy lumbering trot, which under circumstances of violent alarm, they exchange for a furious rush, in which they go straight through the jungle as a horse might burst through standing corn, making the forest ring again with the sound of crashing boughs; and, as they cleave their way through the dense masses of bush, making their progress visible by a long track of waving branches tossing above them, like the wake of a ship at sea. I have been posted on the ridge of a hill so far away from the Bison that they looked, when I caught occasional glimpses of them, no bigger than terrier dogs, and yet have heard the incessant crashing of the jungle quite loud as the game moved to and fro.

They have a great reputation for ferocity amongst both the English sportsmen and the native hunters; and this reputation is in some degree borne out by the fact, that within no very great number of

NO. CCXLIV.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

3. DESCRIPTIONS OF TWENTY NEW SPECIES OF THE GENUS *CARDITA*, FROM THE COLLECTION OF HUGH CUMING, ESQ.

By G. P. DESHAYES.

(Mollusca, Pl. XVII.)

1. *CARDITA PURPURATA*, Desh. (Pl. XVII. fig. 12, 13.) *C. testa ovato-transversa, subtrigona, inæquilaterali, antice brevior, obtusa, depressiuscula, radiatim sulcata, albo-flavescente postice rufescente; umbonibus obliquis prominentibus; lunula minima, profunda, plana, lævigata; costis transverse breviter squamosis, sex et viginti, posticalibus angustis, scabriusculis, una inter alias prominentiore; valvis intus pallide purpureis, ad margines vivide purpureo-radiatis.*

Hab. New Zealand. Coll. Cuming.

2. *CARDITA ESSINGTONENSIS*, Desh. *C. testa elongato-angusta, transversa, maxime inæquilaterali, antice angusta, truncata, inferne sinuosa, postice latiore subspathulata, alba, ad apices fusco-punctata, radiatim inæqualiter costata, in interstitiis costula minore interjecta; costis in latere antico angustis, alteris sensim latioribus et crassioribus, medianis et posterioribus squamosis; umbonibus minimis fulvo-tinctis; lunula parva, profunda, subcirculari, fusca; valvis intus postice superneque fusco-tinctis.*

Hab. Port Essington, Australia. Coll. Cuming.

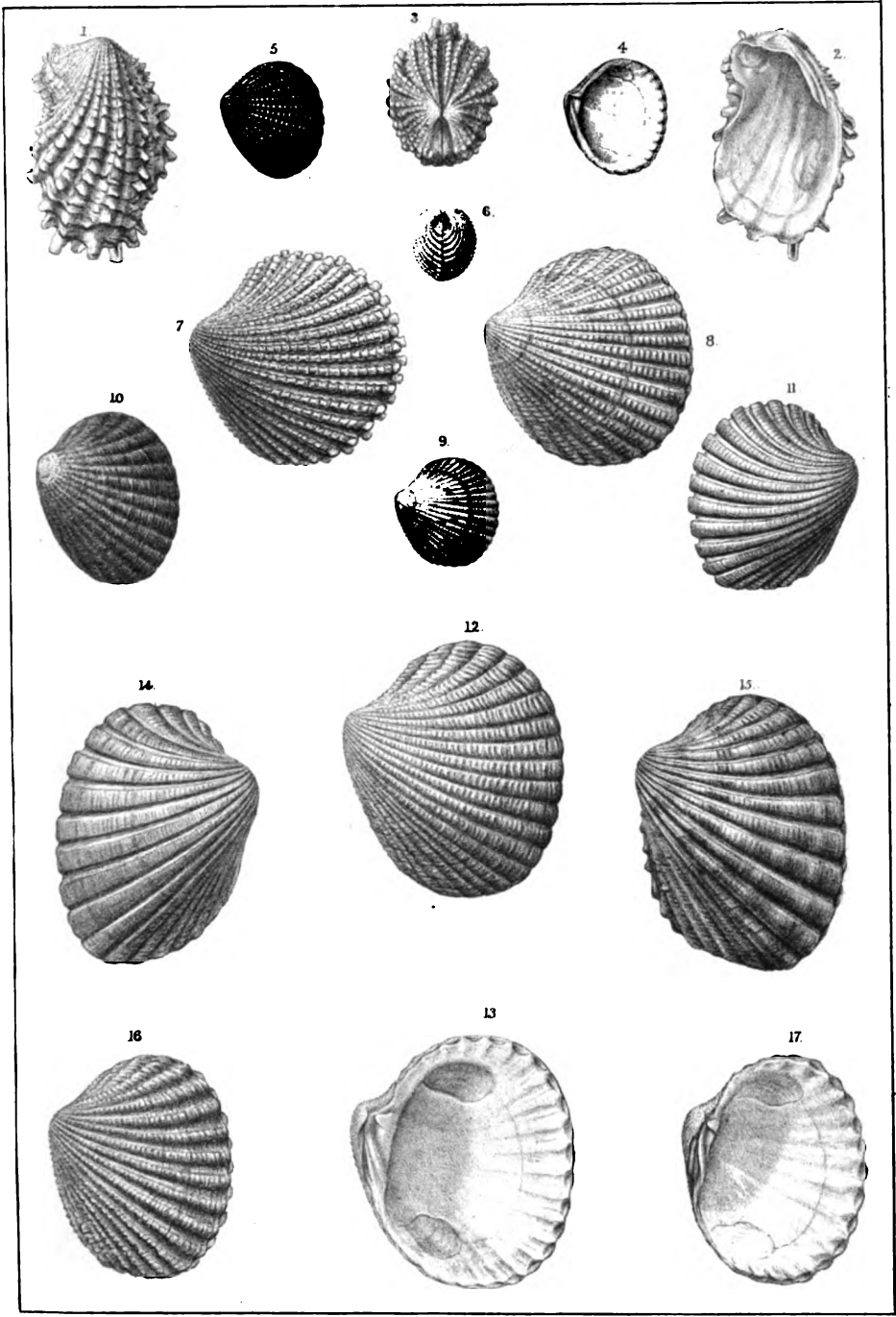
3. *CARDITA CALIFORNICA*, Desh. *C. testa elongato-transversa, lateraliter compressa, inæquilaterali, anterieus pallide fusca, posterius castanea, radiatim costata, costis inæqualibus quatuordecim ad sexdecim, transverse irregulariter striatis, striis antice appressis; costis in latere antico planis, depressis, latis, in medio quatuor vel quinque angulatis, squamis obliquis numerosis imbricatis, posticis inæqualibus, ultima majore squamis majoribus sæpius albidis exasperata; latere antico brevi, obtuso, postico dilatato, oblique truncato; valvis intus atrofusci, antice pallidioribus.*

Hab. Gulf of California. Coll. Cuming.

4. *CARDITA EXCAVATA*, Desh. (Pl. XVII. fig. 1, 2, 3.) *C. testa elongato-transversa, maxime inæquilaterali, antice brevissima, subtruncata, postice dilatata, inferne sinuosa et hiant, longitudinaliter et radiatim costata, alba, costis posticis roseo-flavis vel squallide fuscis; umbonibus minimis, compressis, approximatis, perobliquis; lunula angusta, profundissima; costis inæqualibus, primis in latere antico angustioribus, alteris sensim latioribus et crassioribus squamis prælongis armatis.*

Hab. Sydney. Coll. Cuming.

5. *CARDITA UMBILICATA*, Desh. *C. testa elongato-transversa, maxime inæquilaterali, lateraliter compressa, radiatim costata; latere antico brevissimo, angusto, truncato, postico latiore, dilatato, obtuso; umbonibus minimis, obliquis; lunula angusta, profunda, umbiliciformi; costis octodecim, primis in latere antico angustis, crenulato-squamosis, sequentibus medianis sensim latiori-*



W. H. Balg

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Fig 1 2 3 CARDITA EXCAVATA. Desh Fig 11 CARDITA CASTANEA Desh

4 5	BIMACULATA	12 13	PURPURATA
6 7	ELEGANTULA	14	JUKESI
8 9	AMABILIS	15	CUMINGII
10	VESTITA	16 17	DIFICILIS

bus, longitudinaliter striatis, apice squamosis, alteris convexis, squamis majoribus armatis; valvis albis, atro-fusco irregulariter maculatis præcipue in latere postico.

Var. β . *Testa majore, compressiuscula, costis in medio et postice castaneo-fuscis, linea albicante separatis.*

Hab. Port Cunniugham and Sydney, Australia. Coll. Cuming.

6. *CARDITA GUNNII*, Desh. *C. testa cordata, inflata, minima, alba, suborbiculari, longitudinaliter costata, costis sexdecim, inæqualibus, posticis angustis, nodose squamosis; umbonibus prominentibus, acutis, recurvis; lunula depressa, cordiformi.*

Hab. Van Diemen's Land. Coll. Cuming.

7. *CARDITA ELEGANTULA*, Desh. (Pl. XVII. fig. 6, 7.) *C. testa orbiculato-globosa, cordiformi, alba, fusco pallido maculata, longitudinaliter tenuè costata, costis 20, elevatis, angustis, squamulis erectis, dilatatis, regularibus exasperatis; in latere postico costis angustioribus; lunula magna, cordata, lævigata, explanata; umbonibus tumidis, suboppositis.*

Hab. Chinese Seas. Coll. Cuming.

8. *CARDITA BELCHERI*, Desh. *C. testa ovato-transversa, alba, inæquilaterali, turgida, obliqua; latere antico brevi, postico subdilato; costis longitudinalibus 18 angustis prominentibus, regulariter squamoso-asperatis; lunula parva, viz fossa plana.*

Hab. Philippines (Cubras). Coll. Cuming.

9. *CARDITA ZELANDICA*, Desh. *C. testa minima, orbiculato-subtrigona, depressiuscula, longitudinaliter quatuordecim-costata, subæquilaterali, pallide fusca; costis regularibus, aliquantisper sub-squamosis, interstitiis æquantibus; umbonibus minimis, acutis, suboppositis; lunula parum profunda, fusca, lanceolata.*

Hab. New Zealand. Coll. Cuming.

10. *CARDITA COREENSIS*, Desh. *C. testa ovato-transversa, inæquilaterali, compressiuscula, albo-grisea, longitudinaliter multicostrata; costis depressis, lineis angustis separatis, 20-21, liris transversis, regularibus, approximatis ornatis, posticis quatuor angustioribus; lunula elongato-lanceolata, lævigata, in medio excavata; cardine brevi; valvula dextra dente cardinali trigono, pyramidali.*

Hab. Corea. Coll. Cuming

11. *CARDITA JUKEI*, Desh. (Pl. XVII. fig. 14.) *C. testa ovato-transversa, inæquilaterali, tumida, oblique cordiformi, castanea, aliquantisper ad apices albo variegata, radiatim costata; latere antico brevi, obtuso, postico angustiore, oblique truncato; costis in plerisque simplicibus, planulatis, latis, posticis tribus quatuorve angustioribus; lunula perparva, angustissima, transversa, profundissima.*

Var. α . *Testa costis angustioribus in medio crenulatis.*

Var. β . *Testa subtrigona, costis antice posticeque crenulatis.*

Hab. Australia. Coll. Cuming.

12. *CARDITA BIMACULATA*, Desh. (Pl. XVII. fig. 4, 5.) *C. testa ovato-subtrigona, inæquilaterali, depressiuscula, utroque latere obtusa, sub epidermide squalide fusca albo-grisea, radiatim costata; costis 17-19 angustis, æqualibus, interstitia non superantibus, squamulis regularibus erectis, exasperatis, postice angustioribus; apicibus acutis; lunula profunda, ovato-lanceolata; valvis intus albis, utroque latere fusco maculatis.*

Hab. New Zealand. Coll. Cuming.

13. *CARDITA CRENULATA*, Desh. *C. testa ovato-transversa, oblique cordiformi, turgida, inæquilaterali, radiatim costata, albolutelescente, fusco maculata vel marmorata; latere antico brevi, angusto, postico latiore oblique subtruncato; costis crassis, æqualibus, nodoso-squamosis; nodulis transversis, obtusis, approximatis; lunula depressa, lævigata, cordata, fuscescente.*

Hab. Borneo. Coll. Cuming.

14. *CARDITA VESTITA*, Desh. (Pl. XVII. fig. 10.) *C. testa ovato-transversa, inæquilaterali, compressa, radiatim costata, epidermide fusca spissa vestita; costis 20 planis ad margines evanescentibus, in latere postico quinque angustioribus; lunula minima, profunda, lanceolata.*

Hab. Greenland. Coll. Cuming.

15. *CARDITA AMABILIS*, Desh. (Pl. XVII. fig. 8, 9.) *C. testa suborbiculari, lateraliter compressa, subæquilaterali, radiatim tenue costata, albo-flavicante pallide fusco irregulariter maculata; umbonibus parvis oppositis; lunula plana, vix excavata, lævigata, ovata; costis octo et viginti regularibus, interstitia parum superantibus, eleganter et regulariter crenato-nodosis; cardine incrassato, in valvula dextra unidentato, in sinistra bidentato, dente valvæ dextræ triangulari magno; valvis intus albis.*

Hab. New Zealand. Coll. Cuming.

16. *CARDITA CASTANEA*, Desh. (Pl. XVII. fig. 11.) *C. testa ovato-globosa, subtransversa, inæquilaterali, fusco-castanea, radiatim costata; costis latis, depressis, 22-24, septem in latere postico angustioribus, crenulatis, interstitiis sæpius albis, angustioribus; umbonibus tumidis, obliquis; lunula parva, transversa, profundissima; valvis intus pallide rufescentibus.*

Hab. Australia. Coll. Cuming.

17. *CARDITA CUMINGII*, Desh. (Pl. XVII. fig. 15.) *C. testa ovato-transversa, subtrapeziformi, crassa, solida, tumida, antice cordiformi, radiatim costata, sub epidermide fuscescente tenue striata, albo-flavicante, fusco eleganter maculata et variegata, aliquantisper transverse zonata; costis crassis, planis, ad apices anticeque crenulatis, posticis angustioribus squamis crassis, paucis, irregulariter sparsis, exasperatis; umbonibus magnis, oblique spiralibus; lunula profundissima, angusta.*

Hab. Borneo. Coll. Cuming.

18. *CARDITA SOWERBYI*, Desh. *C. testa ovato-transversa, valde inæquilaterali, crassa, solida, tumida, subcuneiformi, alba vel flavicante, rufo aliquantisper maculata, intus candida; latere antico brevissimo, postico obtuso; sexdecim costata; costis latis, convexis, inæqualibus, medianis latioribus, tuberculis irregularibus exasperatis, in latere superiore tribus quatuorve angustioribus; lunula lata, cordiformi, profundissima.*

Var. β . *Testa minore, roseo-flavicante tincta, lunula paulo minore.*
Hab. Swan River, W. Australia. Coll. Cuming.

19. *CARDITA QUOYI*, Desh. *C. testa ovato-transversa, subæquilaterali, turgida, utroque latere obtusa, rotundata, longitudinaliter costata; costis quatuor et viginti, latis, convexiusculis, postice angustioribus, multo latioribus quam interstitiis, squamis brevissimis, obtusis, numerosis, asperatis, posticis eminentioribus; umbonibus minimis, oppositis; lunula minima, profunda, cordata; valvis intus albo-roseis; impressione musculari postica fusciscente.*

Cardita Australis, Quoy & Gaim. *Voy. de l'Astr.* pl. 80. f. 4 (non Lamk.).

Hab. New Holland. Coll. Cuming.

20. *CARDITA DIFFICILIS*, Desh. (Pl. XVII. fig. 16, 17.) *C. testa ovato-transversa, inæquilaterali, tumida, solida, ad margines convexiuscula, alba, sub epidermide squalide fusciscente immaculata, radiatim costata; umbonibus obliquis, oppositis; lunula parvissima profunda, lævigata, plana; costis subangulatis, squamoso-crenatis, asperis, præcipue ad umbones et in latere postico; interstitiis costulas subæquantibus; valvis intus candidissimis; cardine angusto.*

Hab. New Zealand. Coll. Cuming.

December 14, 1852.

Dr. Gray, F.R.S., Vice-President, in the Chair.

The following papers were read:—

1. NOTES ON THE ANATOMY OF THE TREE-KANGAROO
 (DENDROLAGUS INUSTUS, GOULD).

BY PROFESSOR OWEN, F.R.S., V.P.Z.S., ETC.

The specimen of the above rare species, the first that had been exhibited alive in Europe, was a full-grown and somewhat aged female, having lived in the Society's Menagerie since the 8th of October, 1848. It had suffered from a disease in the tail, for which more than half of that organ had been amputated, and the stump was well-healed. I am not aware what symptoms preceded the animal's death, which took place on the 13th of October, 1852; the

dissection did not bring to light any well-marked morbid appearances.

The external characters of the animal have been so well described and illustrated by the learned Dutch naturalists, MM. Müller and Schlegel, that further remarks on them may be here dispensed with: the chief modifications of the Kangaroo-form which adapt the herbivorous marsupials of the present subgenus to their singular sphere of existence, are a reduction of the length of the hind-limbs to a more near equality with the fore-limbs, which are proportionally longer and stronger than in the land-Kangaroos: the claws of the principal toes in both limbs are longer, stronger, and more curved than in other *Macropodidæ*; they are, in fact, the chief instruments enabling the Tree-Kangaroos to maintain a firm hold on the branches of the trees in which they habitually reside.

As the bones of the animal dissected are still in maceration, any remarks that the osteology of the *Dendrolagus* may require, will be communicated at a future meeting.

Before commencing the dissection the weight of the animal was taken, which was 16 lbs. avoirdupois.

The length of the animal, from the muzzle to the end of the tail, was 2 feet 1 inch; the length of the head was 4 inches 9 lines; the length of the fore-limb, from the head of the humerus, was 12 inches; that of the hind-limb, from the head of the femur, 1 foot 6 inches.

The dental formula was:— $i \frac{3-3}{1-1}$, $c \frac{1-1}{0-0}$, $p \frac{1-1}{1-1}$, $m \frac{4-4}{4-4}$ = 30. The canines, confined as above indicated, to the upper jaw, were much smaller than in the Potoroos, indicative of a closer affinity to the Kangaroo family, which affinity was further manifested by the form and structure of the stomach. The premolars presented the great antero-posterior extent characteristic of the subgenus *Dendrolagus*: they are trenchant, with many minute vertical grooves; they play upon each other like the blades of scissors, and must perform an important part in cutting off the leaves or fruit, or dividing after they are detached, the natural objects of food of the Tree-Kangaroos: the true molars are double-ridged transversely, as in the *Macropodidæ* generally.

The tongue is long, narrow, depressed, with a smooth and even dorsum, showing three fossulate papillæ at its base, arranged in a triangle with the base turned forwards: the *Macropus major* has a single fossulate papilla near the base of the tongue. The epiglottis is broad and large, slightly emarginate at its middle part.

The œsophagus is suspended to the bodies of the dorsal vertebræ by a broad fold of the pleural membranes: it is continued into the abdomen for about 3 inches before terminating in the stomach. The diameter of the tube in a state of contraction is only 3 lines, until within an inch of its termination, when it begins gradually to expand.

A series of well-marked fasciculi of muscular fibres come off from an oblique tract of the external surface of the termination of the œsophagus and diverge in oblique curves which partly surround that termination before the fasciculi spread upon the stomach itself. The

oesophagus terminates 4 inches from the cardiac end of this bag, which is formed by one of the pouches of the sacculated part of the stomach, the sacculated structure being continued through five-sixths of the extent of the organ.

The length of the stomach, measured along the greater curvature when fully distended, is 3 feet 8 inches; the circumference at the middle of the sacculated part is 11 inches. The sacculi are formed chiefly by two longitudinal bands, one along the front, the other along the back part of the stomach, and by a third of narrower extent along the greater curvature, from which the epiploon is continued. The principal sacculi are about fifteen in number; the terminal part of the organ, which has the form of a simple digestive stomach, measures about 6 inches along the greater curvature. The circumference of the pylorus is 2 inches 9 lines. The duodenum expands at its commencement. The epithelium is continued from the oesophagus for a breadth of 2 inches down the posterior surface of the stomach, and of $1\frac{1}{2}$ inch down the anterior surface, and thence is continued slightly diminishing in breadth 3 inches towards the pyloric end of the stomach, and $2\frac{1}{2}$ inches towards the cardiac end. The rest of the cavity is lined with the usual gastric vascular membrane, the surface of which is diversified by patches of follicular apertures along the upper curvature of the stomach, which patches increase in breadth as they approach the true digestive portion. At the cardiac orifice two parallel longitudinal ridges extend along the lesser curvature to the pyloric end of the stomach, $2\frac{1}{2}$ lines in breadth and 7 lines apart, forming a channel of that width leading from the cardiac towards the pyloric orifice; both the muscular and the mucous coats of the stomach increase in thickness towards the pylorus, which is defended by an oblique ridge.

In the great Kangaroo the cardiac end of the sacculated stomach is bifid, and the epithelium lines one of the culs-de-sac: in the rock Kangaroo (*Macr. penicillatus*) the cardiac end terminates, as in the Tree-Kangaroo, in a single cul-de-sac. In the *Hypsiprymni* the whole of the sacculated structure of the stomach is on the left side of the termination of the oesophagus, whereas in the *Dendrolagus*, as in the true Kangaroos, the major part of that structure is to the right of the cardiac orifice.

The intestines were 9 feet in length, the small intestines being 6 feet, the large 3 feet.

The circumference of the cæcum is 5 inches, the length the same. It is simple, and terminates obtusely without diminishing in diameter. The ileo-cæcal aperture is in the form of a narrow transverse slit, 4 lines in extent, with a tumid margin opening upon a fold, which partially denotes the boundary between the cæcum and colon. There is a patch of agminated glands at the beginning of the colon, and smaller patches in other parts of that intestine.

The parotid gland is of large size, and extends far down upon the neck.

The liver is relatively small, and was situated in the right hypochondrium: it consists of a right and left lobe, the former subdivided

and the latter giving off the Spigelian lobe. The large gall-bladder was loosely suspended in a deep cleft of the right lobe. The coats of the ductus choledochus are thickened before the termination of the duct, in common with that of the pancreas, in the duodenum. The spleen, as in the Great Kangaroo, is T-shaped.

The heart showed the usual marsupial structure in the presence of the two distinct superior venæ cavæ, and the absence of the 'fossa' and 'annulus ovalis.' Both right and left lungs were cleft at their anterior margin, and a large azygos lobe was developed from the former, and occupied the part of the posterior mediastinum between the pericardium and diaphragm.

The larynx agreed in structure with that of the Great Kangaroo: the glottis being widely open, and the chordæ vocales very short and rudimentary at the fore part of the 'rima.'

The kidneys presented the usual simple conglobate structure. The ureters passing through the vaginal loops terminate close together 14 lines from the communication of the urethra, or neck of the bladder, with the uro-genital canal.

The ovaria, about 8 lines by 4 lines in size, presented a wrinkled cerebriform surface. A cyst of near an inch in diameter was developed from the left ovary. The oviducts, about $1\frac{1}{2}$ inch in length, terminate each in a subcompressed elongated uterus 1 inch by 3 lines. Each uterus opens by a distinct os tincæ into the fundus of a vagina, with a median cul-de-sac, extending 1 inch 3 lines beyond the commencement of the lateral bent vaginal canals. These canals are about 3 inches in length: they presented a finely longitudinally plicated inner surface, with a semilunar valvular fold 5 lines before their termination in the uro-genital canal: the length of this canal is 2 inches: it then opens, with the rectum, into a short and wide common cloacal vestibule, closed by a strong sphincter muscle. The lateral bent vaginal canals are shorter in proportion than in the *Macropus major*: but the median vaginal cul-de-sac was closed, as in that species.

In a specimen of the *Macropus Bennettii* which I dissected in 1845, I detected a natural aperture of communication between the median cul-de-sac and the urogenital canal. I had the pleasure of showing the specimen to Dr. Poelman, during a recent visit of that eminent Comparative Anatomist to the Hunterian Museum, and of thus confirming the observation which he had, independently, made of a similar modification of the female generative organs in a specimen of the *Macropus Bennettii* dissected by him at the University of Gand*.

The brain of the *Dendrolagus inustus* weighed 6 drachms.

The cerebral lobes were smooth, and showed only a short linear indentation above the anterior part of each. There was no trace of supra-ventricular commissure (corpus callosum), and in all particulars save the more simple external surface the structure of the brain corresponded with that of the Great Kangaroo as described in the 'Philosophical Transactions' for 1837. The proportion of the weight of the brain to that of the body is as 1 to 230; in the *Ma-*

* Bulletin de l'Académie Royale de Belgique, tom. xviii. p. 599.

cropus major it is as 1 to 800, the comparison being made on the body of a large old male. The difference between the large and small species of Kangaroo depends on the brain not increasing in proportion to the increase in the bulk of the entire animal. The smaller species in any natural family of Mammalia, resemble the foetus of the larger species in the greater proportional size of both the brain and the eyes.

2. ON THE MONKEYS OF THE AMAZON. By ALFRED R. WALLACE.

The great valley of the Amazon is rich in species of Monkeys, and during my residence there I had many opportunities of becoming acquainted with their habits and distribution. The few observations I have to make will apply principally to the latter particular. I have myself seen twenty-one species; seven with prehensile and fourteen with non-prehensile tails, as shown in the following list:—

- 3 Howlers, viz.—*Mycetes ursinus*, *M. caraya*? and *M. Beelzebub*;
- 1 Spider Monkey,—*Ateles paniscus*;
- 1 Big-bellied Monkey (*Barrigudo* of the Brazilians),—*Lagothrix Humboldtii*;
- 2 Sapajou,—*Cebus gracilis* (Spix) and *C. apella*?;
- 4 Short-tailed Monkeys,—*Brachyurus couxiu*, *B. ouakari* (Spix), *B. rubicundus* (? *Calvus*, B. M.), and a new species;
- 2 Sloth Monkeys,—*Pithecia irrorata* and an undescribed species;
- 3 Squirrel Monkeys,—*Callithrix sciureus*, *C. personatus* and *C. torquatus*;
- 2 Nocturnal Monkeys,—*Nyctipithecus trivirgatus* and *N. felinus*;
- and
- 3 Marmoset Monkeys,—*Jacchus bicolor*, *J. tamarin* and a new species.

The Howling Monkeys are generally abundant; the different species, however, are found in separate localities; *Mycetes Beelzebub* being apparently confined to the Lower Amazon, in the vicinity of Para; a black species, *M. caraya*?, to the Upper Amazon; and a red species, *M. ursinus*, to the Rio Negro and Upper Amazon. Much confusion seems to exist with regard to the species of Howlers, owing to the difference of colour in the sexes of some species. The red and the black species of the Amazon, however, are of the same colour in both sexes. The species of this genus are seminocturnal in their habits, uttering their cries late in the evening and before sunrise, and also on the approach of rain. Humboldt observes, that the tremendous noise they make can only be accounted for by the great numbers of individuals that unite in its production. My own observations, and the unanimous testimony of the Indians, prove this not to be the case. One individual only makes the howling, which is certainly of a remarkable depth and volume and curiously modulated; but on closely remarking the suddenness with which it ceases and

again commences, it is evident that it is produced by one animal, which is generally a full-grown male. On dissecting the throat, much of our wonder at the noise ceases; for besides the bony vessel formed by the expanded "os hyoides," there is a strong muscular apparatus which seems to act as a bellows in forcing a body of air through the reverberating bony cavity.

Of the genus *Ateles*, the four-fingered Spider Monkeys, one species is found only in the Guiana district, north of the Amazon and Rio Negro. Another, probably *Ateles ater*, inhabits the West Brazil district on the river Purus. These monkeys are slow in their motions, but make great use of their prehensile tail, by which they swing themselves from bough to bough; and I have been informed that two have been seen to join together by their hands and prehensile tails, to form a bridge for their young ones to pass over. The Indians also say, that this animal generally moves suspended beneath the boughs, not walking on them.

The next genus, *Lagothrix*, is a very interesting one, being quite unknown in Guiana and Eastern Brazil. The species I am acquainted with (*L. Humboldtii*) is found in the district south-west of the Rio Negro, towards the Andes, which I call the Ecuador district of the Amazon. They are remarkable for their thick woolly grey fur, their long prehensile tails, and very mild disposition. In the upper Amazon they are the species most frequently seen tame, and are great favourites, from their grave countenances, more resembling the human face than those of any other Monkeys, their quiet manners, and the great affection and docility they exhibit. I had three of them for several months before leaving Brazil, and they were on board with me at the time the ship was burnt, when, with their companions, they all perished.

The Sapajou Monkeys, forming the genus *Cebus*, appear to be more generally distributed, and the species have a wider range. They are also frequently domesticated, but offer a remarkable contrast to the species of the last genus, in their constant activity and restlessness, and they have the character of being the most mischievous monkeys in the country.

Each species of the genus *Brachyurus* appears to be confined to a particular district. The *B. couzi* is a native of Guiana, and does not pass the Rio Negro on the west, or the Amazon on the south. The *B. ouakari* is found on the Upper Rio Negro; the *B. rubicundus* on the Upper Amazon, called the Solimoes; and another species, apparently undescribed, is found on the lower part of the same river.

The Sloth Monkeys, forming the genus *Pithecia*, have an extensive range as regards the genus, but the separate species seem each confined in a limited space. Of the two species inhabiting the Amazon district, one, the *P. irrorata*, is found on the south bank of the Upper Amazon; and another, apparently undescribed and rendered remarkable by a bright red beard round the face and under the chin, occurs only to the south-west of the Rio Negro.

Of the little Squirrel Monkeys, one, the *Callithrix sciureus*, a spe-

cimen of which is now in the Society's Gardens, has an extensive range, being found on both banks of the Amazon and Rio Negro. The *C. torquatus*, a white-collared species, is found only on the Upper Rio Negro, and the *C. personatus* on the Upper Amazon.

Of the curious Nocturnal Monkeys forming the genus *Nyctipithecus* there are two species in this district; one, which appears to be the *N. trivirgatus* of Humboldt, is found in the district of Ecuador, west of the Upper Rio Negro; the other, closely allied, probably the *N. felinus*, on the Upper Amazon. Their large eyes, cat-like faces, soft woolly hair and nocturnal habits render them a very interesting group. They are called "devil monkeys" by the Indians, and are said to sleep during the day and to roam about only at night. I have had specimens of them alive, but they are very delicate and soon die.

Of the Marmoset Monkeys there are three species, though none of them have the characteristic tufts of hair on the head. Each species seems to be confined to a very limited tract of country. The *Jacchus tamarin* is found only in the district of Para, where it is abundant. The *J. bicolor*, a pretty grey and white species, I have only seen on the Guiana side of the Rio Negro near the city of Barra. Another species entirely black, with the face of bare white skin, inhabits the district of the Upper Rio Negro. It appears to be quite new.

The last three genera appear to be to a great extent insectivorous, and I am inclined to think they also devour small birds and mammalia. At least those I have had alive would attempt to pull into their cages any of my small birds which passed near. The little black *Jacchus* last mentioned was particularly savage. He once seized a large parrot by the neck, pulled him into his cage, and bit out a large piece from his bill, and would probably have destroyed it, had I not opportunely come to the rescue. Two other small birds which approached too near his cage he seized and completely devoured.

I will now make a few remarks on the geographical distribution of these animals.

In the various works on natural history and in our museums, we have generally but the vaguest statements of locality. S. America, Brazil, Guiana, Peru, are among the most common; and if we have "River Amazon" or "Quito" attached to a specimen, we may think ourselves fortunate to get anything so definite: though both are on the boundary of two distinct zoological districts, and we have nothing to tell us whether the one came from the north or south of the Amazon, or the other from the east or the west of the Andes. Owing to this uncertainty of locality, and the additional confusion created by mistaking allied species from distant countries, there is scarcely an animal whose exact geographical limits we can mark out on the map.

On this accurate determination of an animal's range many interesting questions depend. Are very closely allied species ever separated by a wide interval of country? What physical features determine

the boundaries of species and of genera? Do the isothermal lines ever accurately bound the range of species, or are they altogether independent of them? What are the circumstances which render certain rivers and certain mountain ranges the limits of numerous species, while others are not? None of these questions can be satisfactorily answered till we have the range of numerous species accurately determined.

During my residence in the Amazon district I took every opportunity of determining the limits of species, and I soon found that the Amazon, the Rio Negro and the Madeira formed the limits beyond which certain species never passed. The native hunters are perfectly acquainted with this fact, and always cross over the river when they want to procure particular animals, which are found even on the river's bank on one side, but never by any chance on the other. On approaching the sources of the rivers they cease to be a boundary, and most of the species are found on both sides of them. Thus several Guiana species come up to the Rio Negro and Amazon, but do not pass them; Brazilian species on the contrary reach but do not pass the Amazon to the north. Several Ecuador species from the east of the Andes reach down into the tongue of land between the Rio Negro and Upper Amazon, but pass neither of those rivers, and others from Peru are bounded on the north by the Upper Amazon, and on the east by the Madeira. Thus there are four districts, the Guiana, the Ecuador, the Peru and the Brazil districts, whose boundaries on one side are determined by the rivers I have mentioned.

In going up the Rio Negro the difference in the two sides of the river is very remarkable.

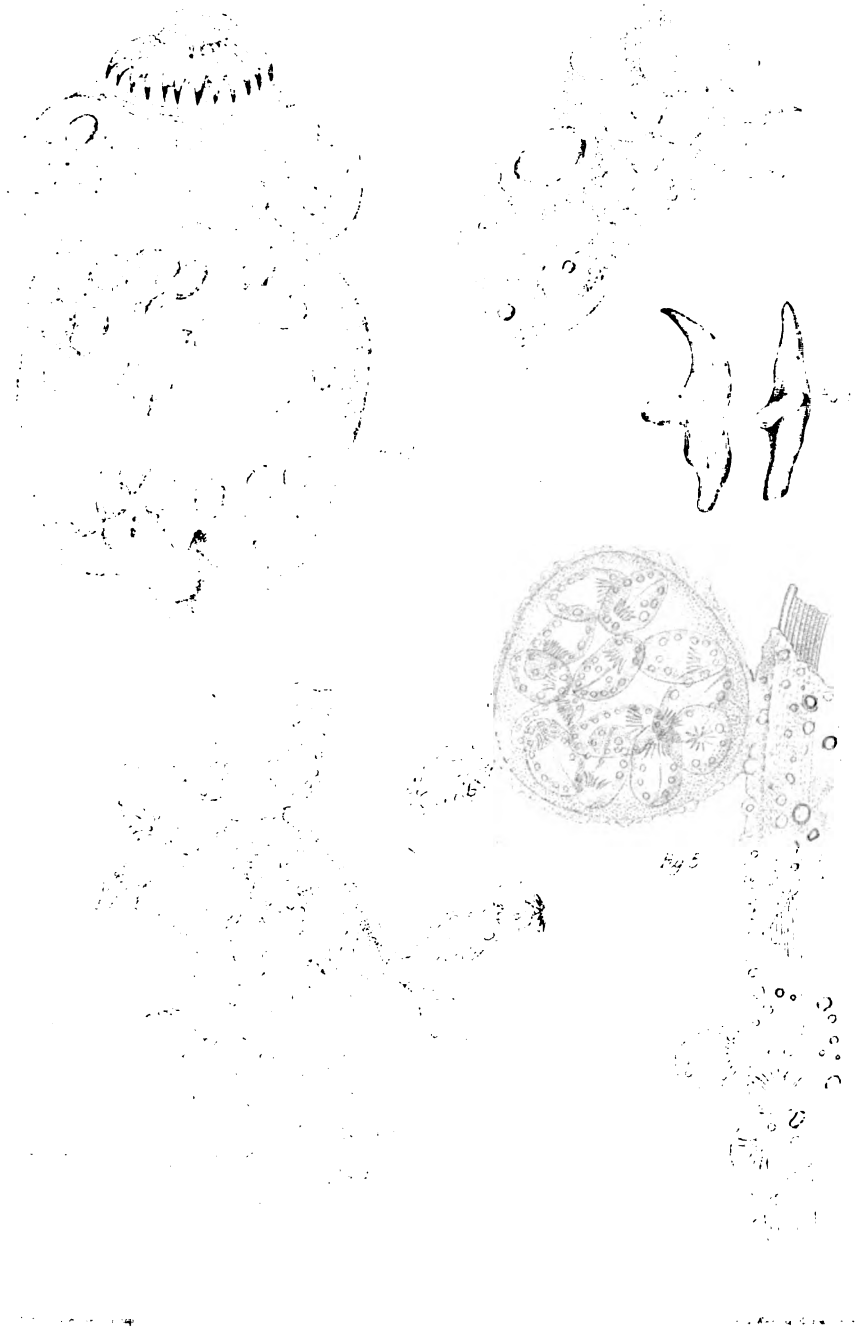
In the lower part of the river you will find on the north the *Jacchus bicolor* and the *Brachyurus Couriu*, and on the south the red-whiskered *Pithecia*. Higher up you will find on the north the *Ateles paniscus*, and on the south the new black *Jacchus* and the *Lagothrix Humboldtii*.

Spix, in his work on the monkeys of Brazil, frequently gives, "banks of the river Amazon" as a locality, not being aware apparently that the species found on one side very often do not occur on the other, though the fact is generally known to the natives. In these observations I have only referred to the monkeys, but the same phenomena occur both with birds and insects, as I have observed in many instances.

3. ON THE ANATOMY AND DEVELOPMENT OF ECHINOCOCCUS VETERINORUM. BY THOMAS HUXLEY, F.R.S.

(Annulosa, Pl. XXVIII. XXIX.)

On the 25th of November, 1852, a fine female Zebra, whilst at play within its paddock, accidentally broke its neck. The animal had always appeared to be quite healthy, and it was in perfectly good condition—but, upon examination, its liver was found to be one mass



Development of the human brain



Fig 8

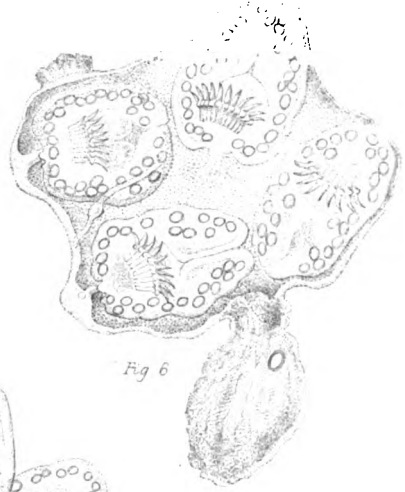


Fig 6



Fig 7

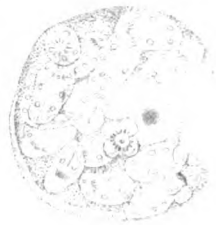
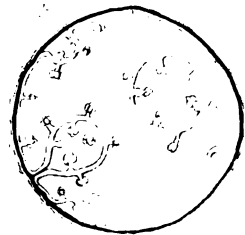
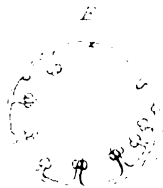
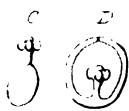
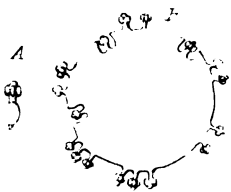


Fig 9



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Development of Echinococcus

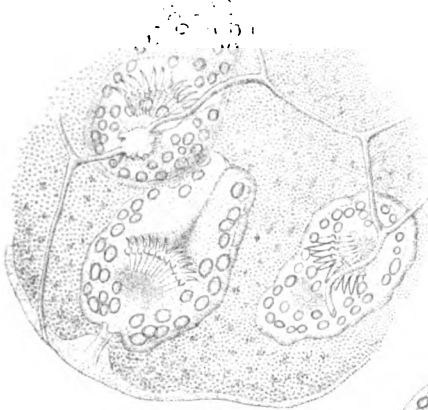


Fig 8



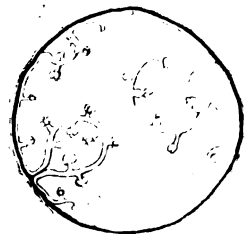
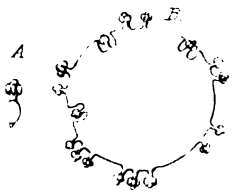
Fig 6



Fig 7



Fig 9



THESE TABLES ARE NOT TO SCALE

Development of Echinococcus

of cysts, varying in size from a child's head downwards. The liver was taken out of the body on the day succeeding the animal's death*—and on the 27th I proceeded to examine the contents of one of the largest cysts (with a portion of its wall) and one of the smaller cysts.

It was at once obvious that the cysts contained the *Echinococcus veterinorum*, and I may here mention that the *Echinococci* were in full life, and remained so for three days, until, in fact, the fluid in which they were contained had become slightly offensive.

It will conduce to clearness perhaps, if I state in successive order I. What I saw myself. II. The theory of the formation of the *Echinococcus*-cysts, and of their relation to other forms of Entozoa, which I have to offer. III. What has been done hitherto.

I. The cysts are nearly spherical vesicles having a very elastic proper wall; so elastic, in fact, as to exercise a continual tension upon the contained fluid, which, if the cyst be pierced, spurts out in a jet, for some time.

The outermost layer of the cyst is an adventitious membrane, formed by the infested animal around the *Echinococcus*-cyst, as it would be developed round any other foreign body; with this I have nothing to do. Within this, and in nowise adherent to it, follows the proper wall of the *Echinococcus*-cyst, which must be carefully distinguished into two portions. The outer is thick, yellowish and constituted by a great number of delicate, structureless laminae composed of a substance closely resembling Chitin. It is to this laminated membrane that the elasticity of the cysts is due—and it must be regarded as precisely analogous to those structureless cysts which surround the pupa forms of *Distomata* imbedded in the body of snails, or to those similarly structureless cysts which enclose the encysted *Tetrarhynchi*, and which Van Beneden saw in course of formation by a process of exudation, around the Scolex form of those worms. The innermost layer of this, which, for distinction's sake, I will call the *Ectocyst*, is whiter and softer than the others, and appears to be in course of formation.

The inner portion of the wall of the *Echinococcus*-cyst is closely adherent to the last described layer of the ectocyst, but may, with great care, be separated from it, when it is at once evident that there is no organic connexion between the two; this layer may be very conveniently termed the *endocyst*—it is the only active living part of the whole wall of the cyst, and represents the proper body-wall of the animal. It is very pale and delicate, and not more than $\frac{1}{3000}$ of an inch thick (Pl. XXVIII. fig. 5). It is composed of very delicate cells $\frac{1}{3000}$ — $\frac{1}{3000}$ of an inch in diameter, without obvious nuclei, but often containing clear, strongly refracting corpuscles, generally a single one only, in a cell. These corpuscles appear to be solid, but by the action of dilute acetic acid, the interior generally clears up very rapidly, and a hollow vesicle is left of the same size as the original

* I beg here to express my obligations to the Secretary of the Zoological Society, without whose kind recollection of a wish to examine fresh Entozoa, which I had expressed, I should not have had the opportunity of making the observations contained in the present paper.

corpuscle. *No gas is developed during this process*, and sometimes the corpuscles are not acted upon at all by the acid, appearing then to be of a fatty nature. A strong solution of caustic ammonia produces a concentrically laminated or fissured appearance in them. Under pressure, and with commencing putrefaction, a number of them sometimes flow together into an irregular or rounded mass.

The inner surface of the endocyst is sometimes irregularly papillated like a glandular epithelium in consequence of the prominence of separate cells (Pl. XXVIII. fig. 5), or its surface presents an even contour, from the presence of a structureless membrane, which varies in thickness, and seems to represent the inner portion of the blastema, elsewhere slightly granular, in which the cells are imbedded (Pl. XXVIII. fig. 2).

Solitary hooks are scattered over the inner surface of the endocyst. I thought at first that they had fallen from the *Echinococci*; but it is with some difficulty that, even by the aid of pressure, the hooks can be so detached from them; and furthermore the hooks in question had generally the appearance of those forms found in the younger *Echinococci*, from which there is still greater difficulty in detaching them. I conclude then that these hooks are developed where they are found, and that they represent a sort of attempt to develop an *Echinococcus* which has gone no further. Within the substance of the endocyst one may see here and there traces of clear delicate vessels, such as those which will be described in the secondary cysts; but probably in consequence of the granular nature of the membrane, they are rarely visible.

In describing the development of the *Echinococci*, it will be necessary to return to this endocyst—at present I pass to the contents of the cyst. This is a clear, colourless, serous liquid, in which two kinds of bodies are found floating, *a. Echinococci*, and *b. secondary cysts*.

a. Echinococci (Pl. XXVIII. fig. 1). To avoid circumlocution, I restrict this term in the present place to what are commonly called the *Echinococcus*-heads.

The *Echinococci* are minute, oval bodies, varying, according to the state of contraction in which they are found, from $\frac{1}{200}$ to $\frac{1}{100}$ th of an inch in their long diameter.

When fully extended, the *Echinococci* are divided by a constriction into two portions; an anterior somewhat conical part, and a posterior oval portion, notched at the extremity; attached to the posterior section, and, as it were, sunk in the notch, there is a small appendage of variable form, which usually appears to be clear and somewhat oval or pyriform, with an irregular ragged extremity.

The body of the *Echinococcus* consists of a very clear transparent substance, slightly granular or dotted internally, and limited externally by a well-marked structureless layer. Forming a circle round the conical anterior extremity there are from twenty to thirty strong hooks, which sometimes appeared to be in a single, sometimes in a double row. In the latter case the hooks of the upper row alternated with those of the lower. A delicate longitudinal striation, as if pro-

duced by muscular fibres, extends from the circlet of hooks through the anterior portion, becoming spread out and lost in the posterior.

The hooks (fig. 3) were about $\frac{1}{700}$ th of an inch in diameter. Their outer half was formed by a strong, curved, conical claw, the inner half by a somewhat crooked process with a blunt end. From the posterior surface of the junction of these two portions a strong rounded spur passed backwards and gave the hook additional firmness in its place. The hook contained a cavity, a process of which passed into each of its portions. Altogether it was not unlike the thickened liber-cell of of a plant.

Behind the circlet of hooks, the shape of a transverse section of the body is quadrilateral, and at each of the four corners a large rounded disc with a more or less flat surface is to be seen,—the sucker. In structure, when unaltered, the suckers appear to be homogeneous, with granules and two or three of the peculiar corpuscles to be described immediately, imbedded in their substance. Under the action of acetic acid, however, a radiated fibrillation frequently became visible.

Scattered through the substance of the *Echinococcus*, and giving it a very peculiar dotted appearance under a low power, a number of oval, strongly refracting corpuscles may be observed. They are very uniform in size, and have a long diameter of about $\frac{1}{800}$ th of an inch. They are what have been called the *calcareous corpuscles* of the *Echinococcus*;—inasmuch, as in the *Cysticerci* and other cystic worms they have been observed to be converted into carbonate of lime; but I believe that this is entirely a result of that peculiar degeneration to which the cystic Entozoa are so liable, and that, in the young and normal adult state, these peculiar corpuscles (which are found in all the *Cestodea* and *Cystica*) are never calcareous, but are composed of an albuminous substance.

The mistake has arisen, I think, from two causes. In the first place, in old cystic worms these corpuscles are frequently converted into a calcareous substance, although they retain their transparency and strongly refracting powers; and secondly, because when acid is added to a number of *Echinococci*, gas is very commonly developed from calcareous substances contained either in them or in the fluid in which they swim; at the same time the action of the acid rapidly causes the corpuscles to become clear vesicles, so that nothing seems more natural than to connect the one circumstance with the other.

Having paid great attention to the process, however, I can decidedly affirm—

1. That acetic acid dissolves out the contents of the corpuscles in young and fresh *Echinococci*, without the least evolution of gas from them; and that the same assertion holds good of the corresponding corpuscles contained in the spirit specimens of *Tenia* and *Bothriocephalus* which I have examined.

2. That caustic ammonia produces little cavities and sometimes a concentric lamination in these bodies.

And, 3rdly, that in a spirit specimen of an *Echinococcus* from the No. CCXLV.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

Panther (which Dr. Hyde Salter kindly lent me), the corpuscles appeared vesicular without the action of any reagent.

It may be said then, that the peculiar strongly refracting corpuscles of the cestoid and cystic Entozoa usually contain an albuminous substance, and sometimes a fatty matter, but that this is very liable to become replaced by a calcareous substance.

Homologically, I think they are identical with the peculiar, elongated, strongly refracting, solid bodies, contained in the skin of both the *Dendrocœle* and *Rhabdocœle Turbellaria*, which in some marine *Planaria*-larvæ, according to Prof. Johannes Müller, are developed into true thread cells, similar to those of the hydroid Polypes. The thread cell of the latter is equally developed as a secondary deposit within a vesicle (nucleus?) contained in the cells of the body; the only difference would be, that whereas in the Polype the succeeding internal deposit takes place in the form of a spiral thread, in the cestoid or cystic Entozoon it takes place as a succession of simple layers, until the vesicle is full.

Aware of the discoveries that have been lately made by Siebold, Van Beneden and Guido Wagner, as to the extent to which the water vascular system is developed in the Cestoid Entozoa; and unacquainted with what had been observed by Dr. Lebert* (vide *infra*), I particularly endeavoured to detect, in the quite fresh *Echinococci*, some evidence of its existence, and I was so far successful, that I could very readily observe in several specimens (examined on the first day) a number of the peculiar flickering cilia so characteristic of this system of vessels wherever it exists. In spite of all my endeavours, however, I could trace nothing of the vessels themselves, in which, by analogy, one has every reason to believe the cilia are contained†. In one *Echinococcus* I observed six of these long flickering cilia in the positions indicated by the short wavy lines in fig. 1 (Pl. XXVIII.). They were so distinct as to be perfectly measurable, their length being about $\frac{1}{3360}$ th of an inch. They were excessively delicate, but broader at the fixed than at the free end, and they completely resembled the corresponding organs in the *Rotifera*‡, *Naidæ*, &c.

Professor Owen has stated (article *Entozoa*, Todd's Cyclopædia, 1839) that the *Echinococci* (from the Pig) which he examined, moved "freely by means of superficial vibratile cilia," p. 118. There were certainly no such cilia upon the *Echinococci* of the Zebra.

The movements of the *Echinococci*, so far as I witnessed them, were confined to slow, undulatory, peristaltic contractions. I found numbers in every stage of contraction, but I could not observe any actually performing the process. The head with the hooks, is drawn

* Prof. Virchow, and the colleagues before whom he laid his observations upon the occurrence of cilia in the pedicle of *Echinococcus* (vide *infra*), appear equally to have overlooked Dr. Lebert's excellent paper, although it is contained in Müller's Archiv for 1843.

† In the *Planaria torva* I have similarly observed the cilia but not the vessels.

‡ See the essay by the author on "*Lacinularia socialis*, &c. &c." in the Microscopical Journal, No. 1, 1852.

in first, as one meets with many forms in which the suckers only protrude at the extremity, like four knobs. The suckers then follow and are turned completely in, so that their proper outer surfaces look towards one another, the coronet of hooks lying beneath them. In this state, which has been so often described, the animal has not more than half its previous length, and takes on a great variety of forms, oval, rounded, heart-shaped, &c. Instances of these varieties are figured in both plates.

b. The secondary cysts.—When the fluid contained within one of the large *Echinococcus*-cysts is emptied into a glass vessel, it is at first turbid with minute white bodies, but these rapidly subside and form a white sediment at the bottom of the vessel. These white bodies vary in size from $\frac{1}{30}$ th of an inch in diameter downwards to $\frac{1}{100}$ th. They are the secondary cysts.

Under the microscope these bodies are seen to be delicate spheroidal sacs, containing *Echinococci*. The largest examined (Pl. XXIX. fig. 9) had at least thirty of these in its interior. It consisted of a very transparent structureless membrane, apparently lined by a delicate granular film, which was most distinct near the pedicles of the contained *Echinococci*. These *Echinococci* in fact were not free like those contained in the primary cyst, which I have previously described, but each was attached by a delicate cord, more or less resembling the "appendage" of the free *Echinococcus*, to the inner wall of the secondary cyst (Pl. XXIX. fig. 8), and radiated thence inwards. These *Echinococci* resembled in all respects those previously described, except that I could observe no ciliary motion in them*; they were in all conditions of protraction or retraction, and exhibited the ordinary movements. None were ever found free in a secondary cyst, and the members of each cyst, as well as those in different cysts, were as nearly as may be of the same size and degree of perfection.

The space left between them in the interior of the secondary cysts was sometimes filled with a clear fluid, and at others more or less obscured by granules. In none of those observed by me was there any trace of the peculiar mode of development of the contained *Echinococci* from the granular contents of the secondary cysts described by Von Siebold (vide *infra*).

The membrane of these cysts was traversed by a meshwork of fine clear delicate vessels, with distinct walls and about $\frac{1}{10,000}$ th to $\frac{1}{15,000}$ th of an inch in diameter. These were not folds, as their lumen could be clearly seen at the edge of a cyst (fig. 8). They terminated in a somewhat wide space at the base of the pedicle of each contained *Echinococcus*, and in one instance I traced a vessel for some distance into this pedicle. There were no cilia nor granules contained in these vessels, but they precisely resemble those canals of which traces were seen in the Endocyst, and their development will, I think, show that they are identical with them.

* This may well arise from my not having examined them till the 26th. Lebert appears to have found the observation of the cilia to be favoured by the interposed membrane of the secondary cyst (vide *infra*).

I may anticipate so far as to say that I believe that these vessels represent the water vascular system of the parent-cyst.

A dark spot may be observed upon the surface of fig. 9. This was a blunt yellowish wrinkled process, like that represented in the lower portion of fig. 7. It was the only projection of the kind in this specimen.

When such a sac as this is burst the *Echinococci* become everted, and the secondary cyst turns itself inside out, so that the *Echinococci* appear to be seated like Polypes upon a central stem. This curious peculiarity has led to much misconception as to the mode of their attachment *within* the cyst. Von Siebold, however, pointed out the true nature of this process as far back as 1837* (*vide infra*).

The smallest free secondary cysts varied in size, as I have said, down to $\frac{1}{100}$ th of an inch, when they contained only four *Echinococci* (Pl. XXIX. fig. 6). These, however, were quite as large as those in the largest secondary cysts.

The structure of the middle-sized and small vesicles was in most respects the same as that of the large ones, but there was this difference, that they possessed, attached to their outer surface, by pedicles, a variable number of oval bodies of the same average size as the *Echinococci* or less, but presenting a yellow wrinkled appearance, containing very few corpuscles, often none, and either exhibiting no trace of the circlet of hooks (fig. 6) or offering only a few, dark irregular and withered looking ones (fig. 7). It was impossible to confound these *external* bodies with accidentally everted *internal* heads, three of which are represented at the upper part of fig. 7; the appearance of the two being more markedly different than even the figure represents it.

I cannot help thinking that these withered *Echinococci*, for that, as will be seen presently, is what they really are, are what Mr. Erasmus Wilson has figured as developing forms (*loc. cit.*).

Development.—We have found free *Echinococci* and free secondary cysts contained in the fluid of the primary cyst: how do they come there? To answer this question we must return to the endocyst. I found adherent to, and growing from it, *a. fixed Echinococci*, and *b. fixed secondary cysts*.

a. Fixed Echinococci.—These, in various stages of development, are scattered all over the inner surface of the endocyst, as in the diagrams E. and F. (Pl. XXIX.)

Elongated elevations of the endocyst (Pl. XXVIII. fig. 5) are first seen: within these the circlet of hooks and then the corpuscles make their appearance: the elevation becomes a papilla, and the papilla, gradually constricting itself at the base, becomes the oval *Echinococcus*, attached by a narrow pedicle. In this state the slightest touch is sufficient to separate the pedicle from the endocyst, and then the *Echinococcus* is set free. The pedicle contracts upon itself so as to

* The *Echinococci* are figured in this everted state by Chemnitz (quoted by Siebold, *art. Parasiten*, Wagner's Encyclopedia, &c.), by Erasmus Wilson (*Medico-Chir. Transactions*, 1845), and by Busk (*Microscopical Transactions*, 1846).

have a rounded form, but it very often betrays its previous adherence by the ragged fragments of the endocyst, which it carries with it.

Whether this is properly a normal process in the *Echinococcus* it is difficult to say, but as Dr. Guido Wagner and Van Beneden have shown, it occurs normally in the *Tetrarhynchida*, and it exactly resembles that detachment of the "tail" from the *Cercaria*, which takes place in the *Distomata*.

As little is it known whether the *Echinococci* undergo any further development. The suggestion first made by Delle Chiaje, that they may dilate into cysts and develop young *Echinococci* within themselves, appears to me highly improbable; and it is an hypothesis which is not needed to account for the secondary cysts.

b. Fixed Secondary Cysts.—The development of these indeed, takes place in such a manner as to preserve the homological relations of the *Echinococci* to the exterior of the parent. The secondary cysts, in fact, are thus formed: *Echinococci* are developed not only from the inner surface of the endocyst, but from its outer surface (Pl. XXVIII. fig. 4). Their growth is probably accompanied by that of the endocyst itself, which thus becomes raised up from the ectocyst and projects into the general cavity (fig. 5). Of course any internal *Echinococci* which happen to be attached to this part of the endocyst are raised up with it (figs. 4, 5): they may be fewer or more according to circumstances. The neck of attachment of the secondary cysts gradually narrows (fig. 4), and at last the secondary cyst, whose size depends entirely upon the number of *Echinococci* developed under the endocyst at one spot, is detached and falls into the cavity. So long as the secondary cyst remains attached, its external *Echinococci* have the normal clear appearance, and are in full health; but when once it is separated, they appear rapidly to wither away and become yellow, losing their hooks and their corpuscles, and eventually disappearing. The original point of attachment of the sac remains as an obtuse cicatrice.

Von Siebold, who has beautifully described the development of the secondary cysts, has, I think (*vide infra*), mistaken the *one* mode of development of the *Echinococci* outside the endocyst for the *only* mode. He appears to have seen the endocyst, when he describes the "delicate membrane in which the young *Echinococcus*-heads are enclosed," and to *assume* merely, that this membrane bursts and sets the *Echinococcus* free upon the inner surface of the parent cyst. Understanding the mode of development to be as stated above, it is easy to comprehend how it is, that the *Echinococci* are so nearly at the same stage of development in all the secondary cysts; and that this stage has no relation to the size of the cysts. The existence of the external *Echinococci* upon the secondary vesicles in this way also, becomes not only intelligible, but almost necessary.

II. The theory which I have to offer of the nature of the *Echinococcus*, is based upon three facts which are now well established. 1st. That young Cestoid Worms, which, from some cause or other, have passed into any other part of the organism of the animal upon which they are parasitic, than the intestine, become abnormally

dilated, at their posterior extremity; and the anterior end may be retracted into the sac thus formed, which then invests it like a double serous sac—a structureless investment may be excreted round this encysted worm or it may not. Such an altered Cestoid Worm as this is called a *Cysticercus*.

2ndly. A dilated Cestoid worm, such as has been just described, may develop new “heads” with suckers and hooks all over its outer surface, never developing any upon its inner surface. Such a Cestoid worm is the *Cœnurus cerebralis*.

3rdly. The Cestoid worms all possess the power of gemmation (or it may be called fission) in their unaltered state: and Bendz (Isis, 1844) has distinctly shown that the vesicular extremity of the *Cysticercus* gemmates. Processes are formed and thrown off, and these develop appropriate heads and hooks, becoming complete *Cysticerci*.

Bearing these facts in mind, it is I think very easy to account for the *Echinococcus*-vesicles. The surfaces which produce the *Echinococci* must be both external; the *Echinococcus*-cyst therefore does not answer to the simple cyst of the *Cœnurus*, or of the protruded *Cysticercus*; but to the double cyst of the retracted *Cysticercus*, the upper half of whose proper outer surface forms the inner wall of the cyst in the retracted state (see Diag. D. Pl. XXIX.).

Suppose the cyst, thus formed, to dilate and to develop a multitude of heads upon this upper half of the outer surface, after the analogy of *Cœnurus*: then the two walls being pressed together into one, it will appear like a simple cyst covered with heads internally (Diag. E.).

If, however, at the same time, in complete correspondence with *Cœnurus*, heads have been developed over the whole outer surface, we have the primary *Echinococcus endocyst* (Diag. F.).

Now the cyst may grow out at a particular point, and so form a bud, which is cast off externally. This takes place in the *Echinococcus* of Oxen. But if it have surrounded itself with a dense cyst, analogous to that of the encysted *Tetrarhynchidæ*, such external budding cannot take place; and if the local growth takes place at all, it will produce a projection internally, and the internal fixed secondary cyst will be produced. These, narrowing at the neck and detaching themselves, become the free secondary cysts as was shown above.

The *Echinococcus* then is a species of *Tenia* which has become dilated and encysted; which has subsequently produced heads all over its external surface, and finally, budding, casts off its vesicular processes internally, because it has no exit for them externally.

Echinococcus is thus the most complex form of that change which young Cestoid Worms are liable to undergo if they wander from their proper nidus; the combination of hooks with suckers refers it to the genus *Tenia*, to which *Cœnurus* and *Cysticercus* may by similar reasoning be shown to belong; and, therefore, like these two latter genera, it must, as a genus, be abolished. It is probable however that *Cysticercus*, *Cœnurus* and *Echinococcus* are modifications of distinct species, or groups of species, of the genus *Tenia*; and are

not mere varieties of one species produced by difference of locality. They are all three found in the brain, for instance.

As to the genus *Acephalocystis*, there is good reason for believing, that all genuine specimens of it are *Echinococcus*-cysts which have either not developed heads, or in which they have been overlooked.

The converse of the anatomical evidence as to the identity of *Echinococcus* with a modified *Tænia*, has just been supplied by some very beautiful researches of Von Siebold's, published in the *Annales des Sciences* for 1852 (or *Annals of Natural History*, December 1852). Von Siebold gave to young puppies spoonfuls of *Echinococcus*-cysts in milk. Upon opening them after a short time, he found innumerable *Tænia* attached all over the surface of the intestine. The cysts had been digested, but the living *Echinococci* had resisted the action of the stomach, and, freed from their imprisonment, had begun to develop joints. Growth had not gone on sufficiently to enable the learned Professor of Breslau to determine the species. He promises, however, a continuation of his researches; and it is to be hoped that we may soon have a complete clearing up of the difficulties with which helminthologists have so long been puzzled, from his able pen*.

III. The literature of *Echinococcus* exhibits a singular instance of the manner in which naturalists delay their own progress, by not attending to what has been done by their predecessors. Goeze wrote in 1782, and effectually demonstrated the cestoid relations of the *Echinococci*, as may be seen by the following extracts from his beautiful work (*Versuch einer Naturgeschichte der Eingeweidewürmer*); nay, before his time, Pallas had on very good grounds conjectured the same thing, and yet half a century afterwards we find this all forgotten, and speculation rife as to the nature of the *Echinococci*.

Goeze thus describes the *Echinococcus*-vesicles (*op. c.* p. 258 *et seq.*):

"C. The small social granular Bladder tape-worm (*Blasen-band-wurm*): *Tænia visceralis socialis granulosa*.

"This is as it were an intermediate form between the great globular Bladder tape-worm (*Cysticercus*), and the many-headed worm found in the brain of staggering Sheep.

"I had already read what Pallas supposes on this subject in the 'Neue Nordische Beyträge,' i. p. 85, when, by a lucky discovery, I made the whole matter out.

"Upon the 1st of Nov. 1781, I met with an excessively distorted Sheep's liver, which was so beset and penetrated by large and small watery vesicles,—the former as large as hens'-eggs, the latter as hazel-nuts,—that, externally, one could discern hardly anything of the substance of the liver.

"The animal itself was almost perfectly healthy. In its total size, this monstrous liver was about equal in breadth to the two hands; and its length was about half an ell: the weight however was four pounds. I was obliged to divide it into two portions in order to be able to get it into a large jar (3 inches, glass) with spirit. When I

* A full account of Siebold's investigations has, in fact, appeared in Siebold and Kolliker's 'Zeitschrift' for 1853, under the title, "Ueber die Verwandlung der *Echinococcus*-brut in *Tænia*."—T. H. April 1854.

pricked one of the vesicles with a needle, the water spirted out, as out of a fountain. I observed, however, that the distended vesicles contained nothing beyond a mere lymph and possessed no special internal vesicle. In separating the one portion of the liver I could not avoid damaging some of the vesicles contained in its interior. Out of these tolerably hard leathery external vesicles, fell bluish, callous (kallöse), internal vesicles, which were still closed. In their substance indeed they were somewhat softer than the outer vesicle; but still far more cartilaginous than the vesicles of the globular, many-headed bladder-worms. On opening these there was found internally in different places a greyish granular matter like the smallest fish roe, which was united to a very delicate mucous membrane, [which] in water however immediately disappeared, so that the granules swam about by themselves. In a vesicle as large as a dove's egg there were thousands, so small that they could hardly be distinguished by the naked eye. Under No. 4. Tub. A of my microscope I could already perceive the organization of these corpuscles. Their form varied greatly; sometimes heart-shaped with an indent above and a dark line; sometimes pitcher-shaped, with two round knobs above, at each side one; sometimes like a horse-shoe with a short dark middle line; sometimes like a rounded handle, with an indent above and with two knobs laterally, and anteriorly rounded off with a dark circlet. When I used No. 1. Tub. A, I saw clearly that they were true tape-worms. The body flat with dark dots; anteriorly four suckers, and on the obtusely rounded proboscis, the double circlet of excessively small hooks; behind, however, in each there was a small excavated indentation like an anus. The others were contracted in quite peculiar forms, and the dark median streak was the hook circlet. Under the compressor, the four suckers, the circlet of hooks and the points become much clearer. In these worms I have observed a circumstance which I have perceived in no other kind of bladder-worm; namely that on pressure the delicate hooks are detached and float about freely.

"This kind of bladder-worm is distinguished then from that inhabiting the brain of staggering sheep by the following circumstances:—

"1. That the vesicles with the granular matter or with many thousand infinitely small worms, are covered by a strong leathery external vesicle in which they lie free.

"2. That their roe-like material swims about in the inner vesicle in a clear lymph, and the single worms are only united together by a delicate mucous membrane, but are not as in those, essentially adherent to the bladder, and not even to their [own] membrane.

"3. That each of these granules or worms is several hundred times smaller than one of the white corpuscles or worms in the central bladder of the staggering sheep.

"This is then the same, but now explained phænomenon, which the acute Pallas has already observed; but has left without elucidation.

"In the 'Stralsund Magazine,' 1. St. p. 81, he has already directed the attention of observers to these points:

"'Whoso will consider the above description of the true bladder-worm, will not perhaps with M. de Haen deny to worms all partici-

pation in the origin of watery tumours and of Hydatids, at least it seems to me very probable that the unattached (*unangewachsene*) watery bladders seen by many observers in the human body—most frequently in abnormal cavities in the liver—are caused by a worm similar to, if not identical with, our bladder-worm, I say from a worm *probably resembling our bladder-worm*; for we find in the liver and lungs of Oxen and Sheep another wonderful kind of watery bladder, which seems to arise from nothing but some kind of animal germ; but however is widely different from our bladder-worm, and cannot have arisen from it.’”

Pallas, after describing some of the Hydatids, goes on to say:

“The water-bladder itself consists of a white, hardish, quite homogeneous membrane, which becomes thinner towards the caudal extremity; wherever it is lacerated it folds back, and may be best compared with a section (as thin as paper) of a boiled cartilage of a young animal. Within, this external strong membrane is lined by a delicate structure or membrane, which is very easily separated from it, and is beset with a great number of small, white, commonly round, or oval, corpuscles. The corpuscles consist, as the microscope shows, of longish globules united together, whose substance appears to be dotted.”

Subsequently (p. 261) Goeze quotes from the ‘*Nordische Beyträge*,’ 1. St. p. 83, thus:

“It is probable that the unattached hydatids which are at times observed in the human body (are), either of the same kind as the proper bladder-tape worm, or are the same as those singular watery bladders, which I have observed and described in the liver and lungs of diseased Calves and Sheep, and which are most certainly also to be ascribed to a living creature, and are not indistinctly organized (at least if we consider the inner membrane strewed over with granular globules).

“On reading through Leake’s treatise upon the ‘*Staggers in the Sheep*,’ p. 85, it seems very probable to me that the bladders in the brain are more similar to those which I have described in the lung and liver in Sheep and Calves, than to the bladder-worm which Tyson and Hartman have described before me (our globular one); nay perhaps, that they even constitute one genus with the former. The small worm provided with a circlet of hooks and four suckers, in these vesicles—might be a development of the globules observed by me.

“I have at present no opportunity of examining these vesicles in the fresh state. Perhaps on applying a stronger magnifying power the granules might exhibit more organization.”

Consequently, Pallas did not at that time know what to make out of the granules of these vesicles. The peculiar organization of these he did not himself see, as I have now discovered, described and figured it. To whom then belongs the first and true discovery of the nature of the granules in the internal membranes of the singular Hydatids of the livers and lungs of Calves and Sheep?

But I wish that I could throw more light upon and explain the mode of origin of these vesicles, and upon the œconomy of the many thousand single worms socially united in a single bladder. Do they

grow? do they disperse themselves? does each build its own dwelling? or where do they remain? shall our successors learn nothing on these matters?

Goeze's figures are very good.

The commonly received view of the relation between the cysts and their *Echinococci* appears to have been first advanced by Delle Chiaje in his *Elmintografia Umana*, p. 30*.

"The said worms, oval, narrowed at the two extremities and enlarged in the middle, are scattered irregularly over the interior of the vesicle. The extremity of the head is garnished with a crown of hooks deprived of suckers. In proportion as they enlarge, these little microscopical bodies take on, little by little, a spherical form, the hooks become detached, and new *Echinococci* are produced in such little bodies, which have transformed themselves into Hydatids. The new worms are the children (figliuolini) of the primitive Hydatid, which was a similar microscopic body. They have a proper vitality, different from that of the vesicle which contains them."

Müller, 'Jahresbericht,' 1836, describes the *Echinococcus*-cysts and their contents found in the urine of a young man labouring under renal disease.

The cysts had a laminated outer coat; some contained *Echinococci* and some none, but in other respects they were completely alike. The *Echinococci* exactly resembled the ordinary figures.

"In a few of the free ones, a trace of a membranous cord, looking as if it had been torn off, appeared at the posterior end of the body; as if the worms had at an earlier period been fixed."

Müller could not make out whether the *Echinococci* were fixed to the interior of the secondary vesicle or not.

Tschudi, 'Die Blasenwürmer, 1837,' observed the retrograding yellow *Echinococci*, which he assumes to be returning to the vesicular form. He considers that the "corpuscles" are ova, and that by their development in the interior of one of these retrograded *Echinococci*, the secondary cysts are formed.

Gluge, 'Annales des Sciences Naturelles, 1837,' describes the corpuscles of the *Echinococci* very carefully and minutely. He was the first to notice the peculiar structure of the endocyst. He says, "I have constantly seen in it a kind of arborization very similar to the formation in fibrinous exudations during the first stage of inflammation. We see these transparent bodies with slightly irregular contours resembling empty blood vessels and ramifying like them. I do not know whether these are true vessels, I merely draw attention to the fact."

In the same year (1837) the second edition of Burdach's 'Physiologie' appeared. It contains an admirable chapter by Von Siebold, upon the development of the Entozoa. Burdach's work is so little known, and so inaccessible in this country—that I think it worth while to subjoin the whole of what Von Siebold says upon this subject:—

* *Compendio di Elmintografia Umana*. Napoli 1825. Compilato da Stephano Delle Chiaje.

"In the development of the *Echinococci* also; much has remained obscure. We must in them always distinguish two things; the parent vesicle, and the proper *Echinococci* enclosed within this. The maternal vesicle is covered internally by an excessively delicate epithelium, in which are contained corpuscles similar, though here generally elongated, to those which we have found in the neck of *Cœnurus*. In the fluid which the maternal vesicle encloses, we meet with a few *Echinococci*, which when they have everted their coronet of hooks and their suckers, allow nothing to be perceived in their interior but a few scattered glassy corpuscles. These *Echinococci* evidently arise from the inner surface of the parent vesicle. My own observations hereupon have been made upon *E. hominis*, *E. veterinorum*, and a new species which, since the number of its suckers varies very much, I will call *E. variabilis*. On examining the inner surface of the parent vesicle we see little vesicles attached here and there, which contain a finely granular substance; out of this mass the *Echinococci* proceed (*hervorkeimen*), sometimes only one, sometimes two, six, seven or more. A portion of the granular mass becomes, in fact, sharply marked off, forms a small roundish body, which, however, by one of its ends, still clearly passes into the rest of the substance; the rounded body gradually takes on a pea shape, the constricted portion elongates, and the body, which has now assumed a more oval form, is connected only by a delicate viscid thread with the mass from which it sprang; we soon now observe in the interior of the body the circlet of hooks and the glassy corpuscles. The *Echinococcus*-head thus far developed now begins to move—everting and retracting its suckers and hooks; the whole body being at the same time sometimes elongated, sometimes contracted. The development of the *Echinococci* having proceeded to this stage, the delicate membrane in which they are enclosed bursts. The young *Echinococci* do not immediately fall out, for they are all connected to the inner surface of the membrane, which until now has enclosed them, by means of a delicate cord or process of the latter, which penetrates at the posterior extremity of the *Echinococcus*, through a pit, into the interior of the body of the *Echinococcus*. The pit looks almost like a sphincter, holding just that cord of the membrane; only after an interval do the cords and the bodies of the *Echinococci* become separated. The mode of connection of these cords with the bodies of the *Echinococci*, and their separation from them, reminds one completely of the relation which the bodies and tails of the *Cercariæ* have to one another. The membranous covering of the young *Echinococci* wrinkles up immediately when it is torn. The *Echinococci* become everted, and so form a rounded heap, in the middle of which the collapsed investment lies hidden, the *Echinococci* being attached to it like the polypes upon a polypidom.

"Such masses of *Echinococci* either remain for a long time hanging to the inner surface of the parent vesicle, or they become detached from it before the single *Echinococci* have separated from the wrinkled membrane. The granular mass contained in the vesicles is probably comparable with nothing else than with a yolk mass, which

supplies the heads with the substance necessary for their development through those fine cords. For the rest, I will not undertake to decide whether all those larger and smaller vesicles, which contain *Echinococcus*-heads and float about free among fully-developed *Echinococcus*-heads in the cavity of the parent vesicle, are detached from the wall of the latter, or whether some few of them do not arise from the free *Echinococcus*-heads themselves, which have developed *Echinococcus*-germs in their interior, and afterwards become distended into vesicles by them; I was often surprised, in fact, to find upon free vesicles containing *Echinococcus*-heads, hooks attached, perhaps remnants of the destroyed circlet of hooks. In such vesicles of *E. variabilis*, in fact, I believe I could trace remains of the suckers. With greater difficulty can we understand the mode of origin and propagation of the maternal vesicle of the *Echinococci*. Since in *Echinococcus hominis* we often find smaller hydatids enclosed within larger ones, we must believe that the external hydatid is the parent in which the others have been subsequently produced. In what manner, however, this enclosure has taken place, I must leave as much unsolved as the origin of the parent vesicle itself."

The next step was made by Dr. Lebert, in his excellent paper (unfortunately without figures), "Einige Bemerkungen über Blasenwürmer," in Müller's Archiv for 1843. From this I make the following extracts:—

"In the most, even freshly examined hydatids, the animals no longer move. Yet not unfrequently, if many vesicles be examined, living groups may be met with. The movement of the animal, while still in the maternal vesicle, consists partly in turning upon its axis, partly in a wavy contraction, comparable to a peristaltic movement. In the interior of these yet living and moving animals I have perceived ciliary motion very clearly. It appeared in the whole interior of the animal, and I could observe it for hours together. At first I could with difficulty distinguish the single vibrating cilia; yet, partly after partial evaporation of the fluid in which the animals were contained, partly by modifying the light with a very fine perpendicular diaphragm, I could succeed in seeing the cilia themselves, which are slightly curved and somewhat hook-like, and hardly more than $\frac{1}{16}$ mm. in breadth. I have seen the single cilia with especial distinctness towards the margin of the animal; commonly, however, they are indistinct, on account of the contemporaneous vibration of a certain number of cilia, which resemble in their motion a field of corn agitated by the wind. The observation of this ciliary motion was perhaps rendered more easy by the circumstance, that I observed the animals still adherent to the finely granular membrane which forms the parent vesicle, and which, in all probability, favourably modified the light."

"As to what concerns the development of the vesicles themselves, it seems to go on in the following manner:—upon the inner wall of a cyst which contains *Echinococcus*-cysts, secondary cysts are formed, which, after they have attained a certain grade of development, be-

come detached from the inner wall of the larger cyst, and fall freely into their cavities, but still show the remains of their attachment in a slightly pointed place: on the inner surface of these secondary vesicles tertiary ones are now formed in the same manner, and so on. The hydatid sacs then arise by a kind of endogenous formation similar to that which Prof. Müller has already so beautifully described in the development of a peculiar kind of hydatid tumours (Balgeschwülste)."

In his Article "Parasiten" (Wagner's Handwörterbuch d. Physiologie, bd. 2, 1844), Von Siebold, after recapitulating his view of the development of the *Echinococci* contained in Burdach's Physiologie, makes the following highly suggestive remarks:—

"Clearly as we can trace the development of the young of the *Echinococcus*, we understand very little of the mode in which the pill-box (ingeschächtelt) aggregations are produced. The multiplication of the vesicles certainly does not take place by division, nor by the formation of buds upon the outer surface of the parent cyst, as some have supposed. The hypothesis remains, that the young *Echinococci* cast off their circlet of hooks, become distended, lose their suckers, and so change into little *Echinococcus*-vesicles, in which a new brood then becomes developed. I must indeed confess that I have not directly observed this process. In any case, the young *Echinococcus* must be in a fit state to wander; and if it should be made out that new *Echinococcus*-vesicles proceed from them in the interior of the parent vesicles, we might also justly assume that the young *Echinococci*, wandering into other organs, or even into other persons, may thus lay the foundation for new colonies. Whether, again, there exists a special cestoid worm provided with sexual organs, with which the *Echinococcus*-vesicles stand in the same relation as the *Cercaria*-sacs do with certain *Trematoda*, time will show. If it be so, the young *Echinococci* must change, having become separated from their pedicle, not into *Echinococcus*-vesicles, but by the elongation of the body into *Teniae*."

Finally, in the 'Verhandlungen der Physikalisch-Medicinischen Gesellschaft zu Würzburg' for 1850, (to which my attention was drawn by my friend Mr. Busk,) I find the following notice:—"Herr Virchow described the ciliary movement which he had observed in the stem by which the young *Echinococci hominis* of Man are attached to the maternal vesicle,—a new observation for this genus."

I have here endeavoured to notice all those Memoirs which, at the time of their publication, made a definite addition to what was already known upon the structure of *Echinococcus*. The literature of the subject is somewhat voluminous, and hence the necessity of this limitation, and the consequent absence of any account of the valuable memoirs of Goodsir, Curling, Busk, and Erasmus Wilson, all of whom had been anticipated by the continental observers.

DESCRIPTION OF THE PLATES.

PL. XXVIII.

- Fig. 1. A single detached Echinococcus-head, with the hooks and suckers protruded. The position of the six observed cilia is indicated by the wavy lines.
- Fig. 2. A fragment of the Endocyst, with one of the abortive hooks.
- Fig. 3. Fully formed hooks from an Echinococcus-head, seen in profile and in front.
- Fig. 4. Secondary cyst still attached to the wall of the primary. The external Echinococci are seen in various stages of extension and contraction; the internal Echinococci shine through the walls of the cyst.
- Fig. 5. A similar cyst, with only one external Echinococcus. The relation of the Endocyst to the laminated Ectocyst is well seen, and the budding Echinococci on the inner surface of the former, which will eventually become external heads of secondary cysts.

PL. XXIX.

- Fig. 6. A very small secondary cyst, with the remains of its pedicle above, and of an external Echinococcus below.
- Fig. 7. Secondary cyst burst at the upper part and allowing three of the internal Echinococci to escape. The contrast of their appearance with the two dark and withered external Echinococci is well-marked.
- Fig. 8. Portion of the wall of a secondary cyst, showing the ramified vessels, and the attachment of the internal Echinococci to its interior surface.
- Fig. 9. A large secondary cyst with no external head, but with the remains of its pedicle appearing as a brownish spot.

Diagrams.—Hypothetical representations of—A. a young *Tenia*; B. a *Canarus*; C. a *Cysticercus*; D. the same, encysted; E. a *Cysticercus*, encysted, enlarged, and developing many heads (like *Canarus*) from the upper portion of its outer (now inner) surface; F. a similar form, which develops heads from the lower portion of its outer (now wholly outer) surface, and so becomes an *Echinococcus*-cyst.

4. DESCRIPTIONS OF NEW SPECIES OF PALUDOMUS, A GENUS OF FRESHWATER MOLLUSKS. BY LOVELL REEVE, F.L.S.

1. *PALUDOMUS RUDIS*. *Pal. testa oblongo-ovata, solidiuscula, spira breviuscula; anfractibus superne leviter depressis, undique obsolete costellato-striatis; apertura subampla, intus callosa; fusco-olivacea, immaculata, intus alba.*

Hab. —?

A rather solid species, encircled with faint rib-like striæ, and of a uniform olive-brown colour.

2. *PALUDOMUS TRIFASCIATUS*. *Pal. testa oblonga, spira sub-elevata; anfractibus plano-convexis, undique costellato-striatis; apertura parviuscula, intus vix callosa; olivacea, fasciis tribus nigricanti-fuscis subirregulariter cingulata.*

Hab. Branch of the Ganges (*Westermann*).

It will be understood that the colour described in these species is that of the epidermis; the substance of the shell in all is of a bluish white, faintly stained with the bands, which are more strongly marked in the interior.

3. **PALUDOMUS PALUDINOIDES.** *Pal. testa oblonga, spira sub-elevata; anfractibus convexis, longitudinaliter lirato-striatis, superne leviter depressis et marginatis; apertura mediocri; virescenti-olivacea, rufo-nigricante irregulariter fasciata.*

Hab. Sikkim branch of the Ganges (Capt. Bacon).

Characterized by a fine sculpture of close-set longitudinal lines.

4. **PALUDOMUS ABBREVIATUS.** *Pal. testa abbreviato-ovata, solida, Neritinaeformi, spira brevissima; anfractibus superne plano-declivibus, deinde convexis, laevibus; apertura sub ampla; olivacea, lineis duabus fuscis interdum obsolete cingulata, aperturæ fauce fasciata.*

Hab. Ceylon.

Of a solid *Neritina*-like form.

5. **PALUDOMUS PHASIANINUS.** *Pal. testa ovato-turbinata, Littorinaeformi, spira acuta; anfractibus convexis, laevibus; apertura parviuscula; alba, rufo-fusco undique longitudinaliter undato-strigata.*

Hab. Seychelles.

This has the form, and more of the general aspect of a *Littorina* than of a *Paludomus*, but the aperture is characteristic of the latter genus.

6. **PALUDOMUS MAURUS.** *Pal. testa subacuminato-turbinata, spira prominente; anfractibus rotundatis, superne subexcavatis et obsolete lineatis; apertura parva; castaneo-fusca, immaculata.*

Hab. Branch of the Ganges (Westermann).

A dark chestnut species of narrower, more acuminate growth.

7. **PALUDOMUS ACUTUS.** *Pal. testa acuminato-turbinata, spira acuta; anfractibus rotundatis, ad suturam excavatis et lineatis, medio lineis incisis cingulatis; apertura parva; virescenti-olivacea.*

Hab. near Pondicherry.

The apex of the shell, which in most species is eroded, is here sharply developed. The whorls are characterized by being encircled round the middle with conspicuous engraved lines.

8. **PALUDOMUS PUNCTATUS.** *Pal. testa acuminato-turbinata, spira acuta; anfractibus convexis, lineis incisis, utrinque peculiariter punctatis, cingulatis; apertura parva; olivacea, nigricante hic illic maculata.*

Hab. Mauritius (Sir David Barclay).

Curiously punctured on either side of the engraved lines, with which the shell is encircled throughout.

9. **PALUDOMUS DECUSSATUS.** *Pal. testa acuminato-oblonga, tenuiuscula, spira subacuta; anfractibus convexis, striis minutis longitudinalibus et transversis undique subtilissime decussatis;*

apertura parviuscula, oblonga; virescenti-olivacea, fasciis tribus rufo-nigricantibus cingulata.

Hab. Ceylon (Layard).

Chiefly characterized by its finely decussated surface.

10. *PALUDOMUS BACCULA.* *Pal. testa oblongo-turbinata, spira prominente, anfractibus plano-convexis, lævigatis, vel, sub lente, subtilissime striatis; apertura parva; olivacea, brunneo-nigro tincta.*

Hab. Branch of the Ganges (Westermann).

A small dark olive turbinated species, besmeared with shining brown black.

11. *PALUDOMUS ERINACEUS.* *Pal. testa obovata, tenuiuscula, anfractibus convexis, liris muricato-squamatis spiraliter cingulatis; apertura sub ampla; atra, intus cærulescente, columella et aperturae limbo castaneo-nigris.*

Hab. Mountain streams of Ceylon (Layard).

This species is closely allied to *P. loricatus*, but proves to be distinct in all stages of its growth. The shell represented in my monograph of this genus (Conch. Icon. *Paludomus*, Pl. 1. fig. 1a) as the young of *P. loricatus*, is the young of this species. In *P. erinaceus* the scales are always open, erect, and prickly. In *P. loricatus* they are closed and nodular, and the shell is of a lighter olive brown. Mr. Cuming possesses characteristic specimens of each species, from the young to the adult.

12. *PALUDOMUS LAYARDI.* *Pal. testa suboblongo-ovata, solida, anfractibus convexis, superne declivibus, costis angustis lævibus, liris intermedia, spiraliter cingulatis; castaneo-fusca; apertura sub ampla, intus alba, columella et aperturae limbo fusco-nigris.*

Hab. Mountain streams of Ceylon (Layard).

A fine solid species of large bold growth, encircled throughout with narrow smooth ribs, having a fine linear ridge between them.

13. *PALUDOMUS ÆREUS.* *Pal. testa ovata, solidiuscula; anfractibus convexis, costis angustis annularibus subdistantibus cingulatis; olivacea, strigis nigris undatis oblique picta; apertura sub ampla, cærulescenti-nigro limbata.*

Hab. Mountain streams of Ceylon (Layard).

The ribs are more ring-like and distant than in the preceding species, and the shell is of a lighter olive colour variegated with obliquely waved black streaks.

14. *PALUDOMUS DILATATUS.* *Pal. testa suboblongo-ovata, spira exsertiuscula; anfractibus rotundatis, superne viz depressis, spiraliter obscure superficialiter liris; intense nigricanti-fusca, immaculata; apertura oblonga, inferne dilatata, intus cærulescenti-alba, bi- vel tri-fasciata, nigro-limbata.*

Hab. Mountain streams of Ceylon (Layard).

Allied to *P. Neritoides*, but of a more oblong form, with a more dilated aperture.

15. *PALUDOMUS CONSTRICTUS*. *Pal. testa subpyramidali-oblonga, solida, spira exserta; anfractibus lævibus vel obscurissime sulcatis, superne concavo-constrictis; olivacea, fascia nigropunctata, moniliformi, versus apicem picta; apertura ovata, callosa, alba.*

Hab. Mountain streams of Ceylon (*Layard*).

This differs from *P. conicus*, to which it is most nearly allied, chiefly by its more oblong and constricted form.

16. *PALUDOMUS CLAVATUS*. *Pal. testa oblongo-ovata, utrinque attenuata, crassa, ponderosa, spira breviuscula, conica; anfractibus lævibus conico-declivibus; nigricanti-olivacea; apertura subdilata, callosa, alba.*

Hab. Mountain streams of Ceylon (*Layard*).

Distinguished from *P. ovatus* in being more gradually attenuated towards the apex.

17. *PALUDOMUS BICINCTUS*. *Pal. testa globosa vel oblongo-globosa, longitudinaliter subobscure sulcato-striata, spira brevi; anfractibus convexis superne subdepressis, et minute spiraliter sulcatis; olivaceo-fusca, nigricante obscure bifasciata; apertura albida.*

Hab. Mountain streams of Ceylon (*Layard*).

Allied to *P. decussatus*, but of more acuminate growth.

5. ON THE PAINTED PIG OF THE CAMAROONS (POTAMOCHÆRUS PENICILLATUS).

By JOHN EDWARD GRAY, PH.D., F.R.S., V.P.Z.S. ETC.

(Mammalia, Pl. XXXIV.)

This Pig was imported into Liverpool, where it remained some time, being regarded as the common Cape "Bosch Vark." It was at length purchased by the Society, and is one of the most interesting additions made during the course of the present year to the very numerous series of animals now in the Gardens.

It differs in colour and proportions from the Cape "Bosch Vark," but like it belongs to a very distinct group of Pigs from those found in Europe and Asia, and from the *Babyrussa* of the Malay Islands.

In the 'Annals and Magazine of Natural History' for October 1852, I gave a short account of this animal, and formed a genus for this group of African Pigs, to which I gave the name of *Choiropotamus*, describing the present species by the name of *C. pictus*, and it is figured under this name in the 'Illustrated London News.' Since these notices were published, I have found that it will be necessary to change both these names; the first because there is a genus of

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fossil animals described by Cuvier, which has been called *Cheiropotamus*. I therefore propose to reverse the words and call the genus *Potamochoerus*. The specific name is changed because the pig appears to have been described in 1848 from a specimen in the Museum of the town of Basle in Switzerland, in a work which has not yet reached this country, but a short abstract of the description has been copied into a French Journal.

The group of *Pigs* (*Sus*, *Cuvier*) may be divided into three very well-marked genera, distinguished by their external appearance, peculiarities in the skull, and by their geographical distribution, thus:—

Genus 1. *Sus*.

The ears rounded; tail slender; face conical, simple, or with a small wart on each cheek; the hinder upper part of the intermaxillary bones simple; the upper canines coming out on the lower edge of the maxilla and then recurved. Found wild in Europe and Asia, but domesticated in all parts of the world.

This genus contains several species, and almost the whole of them are found wild in the forest, whilst some of their descendants are generally to be met with in a domesticated or semi-domesticated state. This is the case with the Pigs found in the islands of the Indian Archipelago, which have been regarded as distinct species.

I may state that it is exceedingly difficult to distinguish the species of this genus, especially from the examination and comparison of the skull. I have examined with care ten skulls of what I believe to be the European Wild Boar and its offspring, grown in this country, at the Cape of Good Hope, and at the Gambia, and twelve skulls of the Wild Boar from Continental India, and though they offer considerable variation, I cannot discover any constant easily-described character by which I can distinguish the European and the Indian kinds from each other, and this is the case with many other genera allied to the Pigs. We have in the Zoological Gardens the Wild Boar of Europe and a Wild Boar and Sow from Madras living side by side, and they have all the appearance of being most distinct species, which may be thus characterized:—

SUS APER.

Covered with crowded bristles, forming a crest on the withers; black speckled, with grey tips to the bristles; the legs hairy, black; hoofs black.

Hab. Europe, Germany.

SUS INDICUS.

Covered with scattered, more rigid bristles, more abundant on the front part of the body; pale grey, blackish on the outside of the shoulders; legs slender, covered with a few bristles; hoofs white.

Female (perhaps half-bred).—Body rather more hairy; the outer front hoof of each hind foot black.

Sus Indicus, Gray, Cat. Mam. B.M.

Hab. India, Madras.

The skulls of the Wild Hogs from Madras and the Himalaya in the British Museum all appear larger, and have the hinder part of the forehead not so high and dilated as in the common Domestic Boar, much resembling the skull of the sows of that species. They can scarcely be all from female animals of the Indian kind.

I may observe that the nasal bones of this genus appear to elongate and occupy a greater part of the length of the face in the adult than in the young animal. In the young they seldom extend beyond a line even with the large foramen on the side of the face, but in the adult they are generally produced much behind it.

Genus 2. BABYRUSSA.

The ears rounded ; tail and limbs slender ; face conical, simple ; the hinder upper part of the intermaxillary bone smooth ; the upper canines (in both sexes) coming out from the side of the jaw and bent upwards from the base, and then arched backwards, sometimes even spirally recurved. *Hab.* The Indian islands.

1. BABYRUSSA ALFURUS.

Genus 3. POTAMOCHÆRUS.

The ears elongate, suddenly tapering and ending in a pencil of hairs ; face elongate, with a long protuberance on each side halfway between the nose and the eye ; the tail thick, high up the rump ; the upper part of the intermaxillary bone swollen, rugose ; the upper canines arising from a prominent bony case on the side of the jaws, coming out on the lower edge of the jaw and then recurved. *Hab.* Africa.

Koiropotamus, Gray, Cat. Mam. B.M. xxvii.

Choiropotamus, Gray, Ann. & Mag. N. H. 1852 (not *Cheiropotamus*, Cuvier, Oss. Foss.).

1. POTAMOCHÆRUS AFRICANUS.

Black ; cheeks whitish, with a large central black spot.

African Wild Boar, Daniel, African Scenery, t. 22 ♂.

Sus africanus, Schreb. Säugth. t. 327, head.

Sus larvatus, F. Cuvier, Mém. Mus. viii. 447. t. 22. Blainv. Osteog. xxii. t. 5 f. t. 8 f.

Choiropotamus africanus, Gray, List Mam. B.M. 185.

Choiropotamus larvatus, Gray, Ann. & Mag. N. H. 1852.

Sus koiropotamus, Des Moul. Dict. Class. H. N. Atlas, t. 7 ♀.

All the specimens which have come under my notice are coloured as above described. But Dr. Andrew Smith (Zool. South Africa) observes, scarcely any two specimens are of the same colour ; some are brownish black, variegated with white, and others almost entirely uniform light reddish brown.

2. POTAMOCHÆRUS PENICILLATUS (Mammalia, Pl. XXXIV).

Bright red bay ; face, forehead, ears and a large spot on the front of the legs black ; edge of the ears, whiskers, streaks over and under the eye, and a continued sub-crested streak along the middle of the

back white; hair of the back short (black at the base), of the sides and whiskers elongate; tail very long, thick.

Sus penicillatus, Schinz, Monog. Säugth. 1848, fide Rev. Zool. 1848, 152.*

Choiropotamus pictus, Gray, Ann. & Mag. N. H. 1852.

Painted Pig of the Camaroons, Illustrated News, 1852.

Hab. W. Africa. River Camaroon. "Gold Coast, Mus. Basle," fide *Schinz*.

A fine male of this species has been living in the Gardens of the Zoological Society since September 1852.

6. ON THE HORNS OF THE SANGA, OR GALLA OXEN, OF GIBBA.
BY J. E. GRAY, PH.D., F.R.S., V.P.Z.S.

Dr. Gray brought before the Society a pair of horns of these oxen, which the British Museum had lately purchased at the sale of the property of the late Earl of Mountnorris, at Arley Hall.

They are the pair mentioned by Mr. Salt in his 'Voyage to Abyssinia,' at p. 258, 4to edit. 1844, where he observes:

"There (Gibba) for the first time I was gratified by the sight of the *Galla Oxen*, or *Sanga*, celebrated throughout Abyssinia for the remarkable size of their horns. Three of these animals were grazing among the other cattle in perfect health, which circumstance, together with the testimony of the natives, 'that the size of the horn is in no instance occasioned by disease,' completely refutes the fanciful theory given by Mr. Bruce respecting this creature.

"The Ras having subsequently made me a present of three of these animals alive, I found them not only in excellent health, but so exceedingly wild, that I was obliged to have them shot.

"The horns of one of these are now deposited in the Museum of the College of Surgeons, and a *still larger pair are placed in the Collection of Lord Valentia, at Arley Hall*. The length of the largest horn of this description which I met with was nearly four feet, and its circumference at the base twenty-five inches.

"I shall only further observe that its colour appears to vary as much as in the other species of its genus; and that the peculiarity in the size of the horns was not confined to the male, the female being very amply provided with this ornamental appendage on her forehead, pp. 258, 259. See also Bruce's 'Voyage,' App. 1. Letters 9 & 10."

Dr. Gray observes that the horns are shorter, and more curved and lyrate than the figure engraved in t. 19, at p. 259 of Salt's 'Travels in Abyssinia,' which also appears to make them bear a larger proportion to the size of the animal than the specimen suggests; and they are quite as remarkable for their erect position on the forehead as for their size.

* I have seen the specimen in the Basle Museum, and it is certainly the species here described, only differing a little in the depth of the colouring.—J. E. G.

They and the core which supports them are very light, compared to their size, and not half the weight of the smaller wide-spreading horns of the long-horned Cape Waggon Oxen. The horns are thin, pale coloured, and of a loose texture, being worn and fibrous on the surface in several parts.

In the lightness and very cellular structure of the core, the thinness of the horny coat, and the large size, they agree with the pair of horns in the British Museum brought from Central Africa by Captain Clapperton, R.N., and Major Denham, R.E., which are figured in Griffiths' 'Animal Kingdom,' vol. iv. t. 201. f. 4; but these horns are shorter and much larger in diameter, and are spread out on the sides of the head like those of the Common Domestic Oxen, and they are very much lighter for their size than those of the *Galla Oxen* or *Sanga*.

Sir Richard Vivian has kindly informed me that he has seen a breed of cattle in Italy, with the horns rather erect, somewhat resembling those of the *Sanga* in position.

7. DESCRIPTION OF A NEW GENUS AND SOME NEW SPECIES OF TORTOISES.

BY JOHN EDWARD GRAY, PH.D., F.R.S., V.P.Z.S. ETC.

Fam. 1. EMYDIDÆ.

1. MANOURIA, n. g.

Animal unknown. Shell rather depressed; caudal plates double, separate; sternum solid, broad, produced and slightly nicked in front, notched behind, with only five pairs of broad shields; pectoral shields short, subtriangular, only occupying the angle between the outer edge of the humeral and abdominal shields; axillary shields small, inguinal larger; the areola of the discal shields central.

The depressed form and divided caudal plates induce me to place this genus in *Emydidæ*. In external appearance it much resembles the North American Land Tortoise, *Testudo gopher*, but it is at once known from that species, and all the other genera of *Testudinidæ*, *Emydidæ* and *Chelydidæ*, by the peculiar form of the pectoral shields, which at first sight might be mistaken for a very large-sized inguinal shield, if that plate were not also present.

In this respect it somewhat resembles the genus *Kinosternon*, but there the shield is only narrower at the inner end, and rather nearer to the centre of the sternum.

Various genera of *Testudinidæ* have the pectoral plate much smaller than the others; and perhaps the small size of the pectoral shield in this genus shows its affinity among the *Emydidæ* to that family.

If it were not for the irregular division of the caudal plates, and the form of the pectoral plate, it might be regarded as nearly allied to the very variable *Testudo Indica*.

1. *MANOURIA FUSCA*.

Pale brown, nearly uniform ; discal shields concentrically grooved, with a central areola ; the anterior and posterior lateral margins acute, slightly sinuated and rather bent up ; the humeral and abdominal plates longer than broad, the abdominal very large ; the gular produced, narrowed in front.

Hab. Singapore.

Unfortunately we only possess a single very imperfect specimen of this very interesting Tortoise, wanting several of the discal shields.

2. *EMYS LATICEPS*.

Shell pale olive, yellowish beneath ; sides rounded, hinder lateral margin rather expanded and recurved, hinder end rather compressed above ; shields thin, transparent, inferior plates with a narrow black edge ; head large, short, broad, covered with a smooth skin ; neck with very narrow yellow lines.

Hab. West Africa, River Gambia (*M. Castang*).

This is the *only* *Emys* yet found in West Africa, and is easily known by its short broad head.

Fam. 2. *CHELYDIDÆ*.3. *HYDROMEDUSA SUBDEPRESSA*.

Shell oblong, depressed, dark brown, entire, rounded in front, rather angular behind ; nuchal plate short, broader than the post-vertebral ; post-vertebral square, as long as broad, with the front angles produced ; sternum pale brown ; gular plates short, unequal ; head grey ; lips and beneath white ; neck with small conical warts.

Hab. Brazils.

There is in the British Museum collection a single adult specimen of this species, which has some of the plates of the back and sternum divided into a number of small roundish shields.

The specimen was sent from Brazil to Mr. Brandt of Hamburg, who transmitted it to the Museum. It may be only a variety of *H. flavilabris*, but the nuchal and post-vertebral shields are very differently shaped.

4. *HYDRASPIS SPIXII*, Gray, Cat. Rept. B. M. 30.

Shell oblong, depressed ; middle of the back flat ; marginal shields very broad in front, narrow and bent up on the sides, broader and arched over the hind legs ; the post-vertebral shield large, as wide as long ; third and fourth narrow, longer than broad ; the fourth and fifth with an acute keel on the hinder edge ; sternum rather broad ; head very large, crown and temples covered with small shields ; ears prominent ; neck smooth ; lower part of the outer edge of the hind leg with four larger plates, the last compressed and largest.

Hab. Brazils, Para.

There is an adult stuffed specimen, and a skeleton of nearly the same size, of this species in the British Museum collection.

This species is very like *H. gibba*, but the back is more depressed,

the margin much wider, the head nearly double the size, compared with the size of the body, and the scales on the head are small, more numerous and more equal in size, and those on the edge of the hinder legs are larger and more equal in size.

Fam. 3. TRIONYCIDÆ.

CYCLANORBIS PETERSII.

Shell broad, rounded before and behind; sternal callosities five.

Hab. West Africa, River Gambia.

This genus was proposed by Dr. Peters, on his return from Mozambique, for a soft Tortoise which he discovered in that country, which has flaps to the sides of the sternum, covering the legs like the *Amydæ* of Asia, but differs from these in having no bones on the margin of the dorsal disk, which is soft and flexible as in the *Trionyces* with exposed legs.

This species from the Gambia appears to be distinct from the one noticed by Dr. Peters in Mozambique; I have therefore named it after that excellent naturalist, who has made such sacrifices for the extension of our knowledge of natural history, and of zoology in particular.

8. DESCRIPTIONS OF FOURTEEN NEW SPECIES OF LAND SHELLS,
FROM THE COLLECTION OF HUGH CUMING, ESQ.

BY DR. L. PFEIFFER.

1. *HELIX BISULCATA*, Pfr. *H. testa late umbilicata, convexo-depressa, solidula, spiraliter et minutissime oblique striata, nitida, fulvo-castanea; spira breviter conoideo-convexa, apice obtusula; sutura impressa; anfr. 6½ convexiusculis, ultimo multo latiore, periphæria obsolete angulato, antice non descendente, basi plano, circa umbilicum subcompresso, utrinque medio impresso-sulcato; apertura parva, parum obliqua, subtriangulato-lunari; perist. subsimplice, marginibus vix conniventibus, dextro recto, declivi, basali leviter arcuato, subincrassato.*

Diam. maj. 29, min. 25, alt. 13 mil.

Hab. in Tasmania.

2. *HELIX MERZIANA*, Pfr. *H. testa umbilicata, conoidea, tenuiuscula, superne subtiliter ruguloso-striata, fusca, strigis et maculis lutescentibus marmorata; spira convexo-conoidea, obtusula; sutura impressa, marginata; anfr. 5½ convexiusculis, ultimo acute carinato, antice non descendente, basi subplano, minute striato, flavido, juxta carinam compressam castaneo-unifasciato; umbilico latiusculo, extus subinfundibuliformi; apertura perobliqua, securiformi, intus iridescente; perist. subconnivente, margine dextro tenui, antrorsum curvato, subdepresso, columellari et basali per-arcuatis, subincrassatis.*

Diam. maj. 23, min. 20, alt. 9½ mill.

Hab. S. Cristoval ins. Salomonis.

3. *HELIX COSTULOSA*, Pfr. *H. testa umbilicata, solidiuscula, conoidea, carinata, oblique subtiliter costulosa, alba, epidermide lutescente induta; spira regulariter conoidea, obtusula; sutura impressa; anfr. 6½, viz convexis, ultimo non descendente, remote subvaricoso, basi paulo convexiore; umbilico subangusto, pervio; apertura obliqua, sublanata; perist. obtuso, marginibus remotis, supero recto, basali substricto, breviter reflexo, ad columellam subito ascendente, dilatato.*

Diam. maj. $17\frac{1}{2}$, min. $15\frac{1}{2}$, alt. 10 mill.

Hab. in insulis Salomonis.

4. *BULIMUS IRIS*, Pfr. *B. testa imperforata, ovato-conica, solidula, rugoso-striata, sub epidermide decidua, fulvida, cærulescente, strigis albidis et angustis spadiceis ornata; spira conica, apice pallida, obtusula; anfract. 5, supremis planis, ultimo ¾ longitudinis æquante, ventroso, basi late carinato, carina utrinque linea impressa marginata; columella substricta, alba, callosa; apertura viz obliqua, ovali, basi angulata, intus cærulescente; peristom. subincrassato, breviter expanso, marginibus callo albo junctis.*

Long. 64, diam. 32 mill.

Hab. La Ceja, Rio Negro Novæ Grenadæ (Bland).

5. *BULIMUS FLEXUOSUS*, Pfr. *B. testa compresse umbilicata, oblongo-turrita, tenuiuscula, sublævigata, obsolete punctato-striata, subopaca, albida, strigis spadiceis in ziczac flexis, albo-punctatis, fasciisque nigricantibus, altera mediana, altera basali ornata; spira elongato-conica, apice obtusula; anfract. 7, modice convexis, ultimo spira brevior, basi rotundato, pone aperturam striga lutescente cincto; columella viz plicata, lilacea; apertura parum obliqua, oblongo-ovali, intus lilacina; perist. albo, tenui, undique dilatato, margine dextro expanso, columellari patente.*

Long. 40, diam. 14 mill.

Hab. Marinato Novæ Grenadæ.

6. *BULIMUS BARANGUILLANUS*, Pfr. *B. testa compresse umbilicata, ovato-pyramidali, tenuiuscula, striatula, viz nitidula, lutescenti-albida, strigis subrectis, angustis, fulvis irregulariter signata; spira elongato-conica, acutiuscula; sutura levi; anfractibus 7, planiusculis, ultimo spiram superante, convexo, antice subascendente, basi subcompresso, pone aperturam striga extus cærulescente, intus spadicea, cincto; columella leviter arcuata, superne subplicata; apertura ampla, verticali, elliptico-ovali; peristomate tenui, dilatato, margine dextro expanso, columellari late reflexo, patente.*

Long. 32, diam. $13\frac{1}{2}$ mill.

Hab. Baranguilla in Andibus Columbianis (Bland).

7. *BULIMUS ASCENDENS*, Pfr. *B. testa imperforata, ovato-oblonga, solida, irregulariter striata et lineis impressis spiralibus obsolete decussata, parum nitida, fulva, strigis sparsis castaneis ornata; spira elongata, convexa, obtusa; sutura simplice, anfractuum superiorum levi, ultimarum profunda; anfractibus 7-8, superis*

planis, sequentibus convexiusculis, ultimo $\frac{1}{2}$ longitudinis æquante, rotundato, antice subascendente; columella alba, subverticali, superne leviter plicata; apertura angusta, subelliptica, intus albida; peristomate leviter incrassato, recto.

Long. 95, diam. 34 mill.

Hab. in Brasilia.

8. *BULIMUS ACHILLES*, Pfr. *B. testa imperforata, oblongo-ovata, solida, longitudinaliter striatula, striis remotioribus spiralibus subdecussata, viz nitidula, fusco-olivacea, strigis saturate rufis, ad suturam dilatatis ornata; spira convexo-conica, superne rufula, apice obtusula; sutura levi, anfractus ultimi crenulata et marginata; anfract. $6\frac{1}{2}$, viz convexiusculis, ultimo spiram æquante, antice subascendente, basi attenuato; columella alba, superne sub-torta, basi viz recedente; apertura viz obliqua, semiovali, intus cinerea, nitida; peristom. albo, viz incrassato, recto, margine dextro repando.*

Long. 57, diam. 25 mill.

Hab. in ripis fluvii Amazonum.

9. *BULIMUS REQUIENI*, Pfr. *B. testa oblongo-ovata, tenuiuscula, longitudinaliter confertim striata, parum nitente, olivaceo-fusca, ad suturam rufo-submaculata; spira conica, apice obtuso, subimmerso; sutura submarginata; anfract. 5, convexiusculis, celeriter accrescentibus, ultimo spira viz brevior, obsoletius striato; columella callosa, leviter arcuata, ad basin apertura obliquæ, ovalis, obsolete truncatula; peristom. simplice, recto, intus fusco-limbato.*

Long. 62, diam. 26 mill.

Hab. in Brasilia.

10. *BULIMUS FORTUNEI*, Pfr. *B. testa viz subperforata, turrata, solidula, longitudinaliter confertim costulato-striata, viz nitidula, subdiaphana, cerea; spira regulariter turrata, obtusa; anfract. $7\frac{1}{2}$, convexiusculis, ultimo $\frac{1}{3}$ longitudinis subæquante, basi rotundato; columella leviter arcuata; apertura obliqua, ovali, basi rotundata; peristom. simplice, recto, margine dextro repando, columellari anguste fornicatim reflexo.*

Long. 11, diam. 4 mill.

Hab. Shang Hi, Chinæ (Fortune).

11. *PARTULA SALOMONIS*, Pfr. *P. testa subumbilicata, ovato-conica, solidula, longitudinaliter distincte et confertim striata, subepidermide decidua, fulva, alba; spira conica, acutiuscula; sutura levissime crenulata; anfract. 5, convexis, ultimo $\frac{1}{2}$ longitudinis æquante, basi rotundata; columella leviter arcuata, medio subplicata; apertura fere verticali, auriformi-oblonga; peristom. aurantiaco, labiato, margine dextro substricto, breviter expanso, superne curvato, columellari per dilatato, patente.*

Long. 34, diam. 18 mill.

Hab. in insulis Salomonis.

12. *PARTULA REEVEANA*, Pfr. *P. testa anguste umbilicata, ovato-conica, solida, longitudinaliter striatula, carnea, epidermide fulva, strigata; spira elongato-conica, apice rubicunda, obtusula; sutura mediocri; anfract. 5, convexiusculis, ultimo spira brevior, turgido, basi saccato; pariete aperturali dente magis minusve distincto munito; columella vix plicata; apertura verticali, oblonga, oblique truncata; peristom. calloso, roseo, expanso, margine dextro substricto, columellari dilatato, reflexo.*

Long. $21\frac{1}{2}$, diam. 11 mill.

Hab. in insulis Salomonis.

13. *PARTULA MICANS*, Pfr. *P. testa profunde rimata, subperforata, ovato-conica, tenui, striis incrementi confertis et lineis spirulibus distincte decussata, diaphana, nitidula, pallide cornea; spira conica, acutiuscula; sutura profunda; anfract. fere 5, convexis, ultimo spiram æquante, basi rotundato; columella leviter arcuata; apertura vix obliqua, oblongo-ovali; peristom. albido, expanso, acuto, marginibus conniventibus, columellari dilatato, patente.*

Long. 15, diam. 8 mill.

Hab. in insulis Salamonis.

14. *CLAUSILIA SHANGHIENSIS*, Pfr. *Cl. testa subrimata, fusiformi-turrita, solidula, oblique striatula, castaneo-fusca, nitidula; spira turrita, acutiuscula; sutura levi, simplice; anfract. 10, vix convexiusculis, ultimo antice validius striato, basi tumido; apertura subrotundo-pyriformi; lamellis mediocribus, intus perapproximatis; lunella brevi, arcuata; plica palatali 1 supera, subelongata, subcolumellari, inconspicua; peristom. albo, continuo, superne breviter soluto, undique anguste expanso.*

Long. 17, diam. $4\frac{1}{4}$ mill.

Hab. Shang Hi, Chinæ (Fortune).

9. DESCRIPTIONS OF TWENTY-FOUR NEW SPECIES OF LAND SHELLS, COLLECTED BY M. SALLÉ ON THE ISLAND OF ST. DOMINGO, FROM MR. CUMING'S COLLECTION. BY DR. L. PFEIFFER.

(Mollusca, Pl. XIII.)

1. *HELIX PHÆDRA*, Pfr. *H. testa imperforata, conoideo-depressa, tenui, irregulariter striata, pellucida, nitidissima, fulvo-cornea; spira brevi, obtusula; sutura impressa; anfr. 5, convexiusculis, sensim accrescentibus, ultimo antice deflexo, basi planiusculo; apertura perobliqua, truncato-ovali; perist. subsimplice, marginibus vix conniventibus, supero recto, basali incrassato, ad regionem umbilicalem sensim dilatato, adnato.*

Diam. maj. 18, min. 15, alt. $8\frac{1}{2}$ mill.

2. **HELIX PRUINOSA**, Pfr. *H. testa perforata, globoso-depressa, tenui, oblique subconfertim filoso-plicata, diaphana, rufa, non nitente, quasi pruinosa; spira breviter conoidea, acutiuscula; sutura profunda; anfr. $4\frac{1}{2}$, convexis, ultimo rotundato, antice vix descendente; apertura obliqua, lunato-rotundata; perist. tenui, marginibus subconniventibus, supero recto, basali leviter arcuato, reflexiusculo, columellari paulo latius reflexo.*

Diam. maj. 11, min. $8\frac{1}{2}$, alt. $6\frac{1}{2}$ mill.

3. **HELIX STRUMOSA**, Pfr. *H. testa umbilicata, depressa, tenui, oblique costulata, diaphana, vix nitidula, carneo-rufa, fascia pallida, utrinque rufo-marginata, ornata; spira vix elevata, obtusula; sutura profunda; anfr. $4\frac{1}{2}$, convexiusculis, sensim accrescentibus, ultimo superne subangulato, antice deflexo, pone aperturam strumoso et strangulato, basi convexo; umbilico mediocri, infundibuliformi; apertura perobliqua, lunato-ovali, intus nitida; perist. tenui, marginibus approximatis, supero valde curvato, expansiusculo, basali breviter reflexo, intus plica obliqua munito.*

Diam. maj. $16\frac{1}{2}$, min. $13\frac{3}{4}$, alt. 7 mill.

4. **BULIMUS TENUPLICATUS**, Pfr. *B. testa subrimata, oblongo-turrita, solidula, longitudinaliter subarcuatim tenuiplicata, opaca, cretacea, strigis castaneis interruptis vel triserratis ornata; spira elongata, subcurvilineari, apice acuta, nigra; sutura subsimplice; anfr. 12, convexiusculis, ultimo paulo angustiore, rotundato, $\frac{1}{4}$ longitudinis subæquante, basi castaneo-bifasciata; columella obsolete plicata; apertura subverticali, lunato-rotundata; perist. tenui, marginibus conniventibus, dextro sinuoso, filoso-expansiusculo, columellari dilatato, patente.*

Long. 18, diam. $6\frac{1}{2}$ mill.

5. **BULIMUS LUDOVICI**, Pfr. *B. testa breviter rimata, subfusiformi-turrita, solida, leviter striata, vix nitidula, cretacea, maculis oblongis, fusco-corneis sparse variegata; spira vix curvilineari, turrita, apice acutiuscula, lutescente; sutura profunda, simplice; anfr. 12, convexis, ultimo angustiore, $\frac{3}{4}$ longitudinis æquante, basi attenuato, juxta rimam subcompresso; columella superne subtorta; apertura subverticali, lunato-rotundata; perist. tenui, marginibus conniventibus, dextro subrependo, expansiusculo, columellari dilatato, patente.*

Long. 17, diam. 5 mill.

6. **BULIMUS CYRTOPLEURUS**, Pfr. *B. testa subperforata, oblongo-turrita, solidula, valide arcuato-costata, nitidula, alba, maculis rotundis, fusco-corneis, suboblique seriatis picta; spira subcurvilineari, turrita, apice acuta, pallide cornea; sutura simplice; anfr. 12, modice convexis, ultimo vix angustiore, $\frac{1}{4}$ longitudinis vix superante, subtiliter filo-carinato, fascia an-*

gusta, basali, cornea signato; columella levissime plicata; apertura subobliqua, lunato-subcirculari; perist. tenui, marginibus subconvergentibus, dextro perarcuato, vix expansiusculo, columellari dilatato, patente.

Long. 15, diam. $4\frac{1}{2}$ mill.

7. *BULIMUS HERMANNI*, Pfr. *B. testa subperforata, cylindraceo-turrita, tenui, oblique plicatula, nitidula, albida, strigis obliquis et punctis corneis, pellucidis variegata; spira elongata, supra medium sensim in conum apice acutum, corneum attenuata; sutura levi, regulariter crenata; anfr. 10, vix convexiusculis, ultimo rotundato, $\frac{1}{4}$ longitudinis vix superante; columella subplicata; apertura parum obliqua, lunato-rotundata; perist. tenui, marginibus subconniventibus, dextro filoso-expansiusculo, columellari dilatato, patente.*

Long. 12, diam. $4\frac{1}{2}$ mill.

8. *ACHATINA RICHARDI*, Pfr. (Pl. XIII. fig. 10.) *A. testa ventroso-subfusiformi, tenuiuscula, plicis confertis longitudinalibus, infra medium anfr. ultimi obsoletis, lineisque spiralibus confertis undique sculpta, diaphana, corneo-fulva, strigis latis, angulosis et dentatis, saturate castaneis, maculisque minoribus fuscis, picta; spira conica, acutiuscula; sutura impressa, crenato-marginata; anfr. 7, superis planiusculis, sequentibus convexiusculis, ultimo spiram subæquante vel superante, basi subattenuato; columella callosa, subverticali, leviter torta, basi vix truncata; apertura verticali, rhombeo-semiovali; perist. simplice, margine dextro antrorsum leviter arcuato.*

Long. 28, diam. 11 mill.

9. *CYLINDRELLA MENKEANA*, Pfr. (Pl. XIII. fig. 7.) *C. testa breviter rimata, oblongo-ovata, superne in conum acutiusculum, plerumque subtruncatum producta, subtilissime arcuato-striata, sublævigata, nitida, alba, strigis irregularibus corneis notata; sutura levi, pliculato-crenata; anfr. (integris) 14, vix convexiusculis, ultimo angustiore, basi compresse filo-carinato, antice vix soluto; apertura subobliqua, subcirculari, plica levi columellæ subcoarctata; perist. continuo, undique breviter expanso et reflexiusculo, superne vix libero.*

Long. 31, diam. 12 mill.

10. *CYLINDRELLA MALLEATA*, Pfr. *C. testa breviter rimata, subcylindracea, sursum attenuata, truncata, solidula, minute malleato-punctata, alba; sutura levissime crenulata; anfr. superst. 10, planiusculis, supremis pallide carneis, striatis, sequentibus subæqualibus, ultimo angustiore, basi carina compressa, funiformi munito, antice vix soluto; apertura vix obliqua, subrotunda, basi canaliculata; perist. continuo, albo, undique expansiusculo et reflexo.*

Long. 31, diam. 8 mill.

11. *CYLINDRELLA FLAMMULATA*, Pfr. (Pl. XIII. fig. 8.) *C. testa breviter rimata, subcylindracea, medio paulo ventrosiore, superne truncata, tenuiuscula, laevigata, nitida, flammis latis, corneis et opacis, lacteis variegata; sutura levi, remote et obsolete nodosa; anfr. superst. 10, convexiusculis, ultimo paulo angustiore, basi carina subcompressa, funiformi, denticulata munito, antice striato, non soluto; apertura subobliqua, subcirculari, basi vix canaliculata; perist. vix continuo, albo, expanso et reflexiusculo, superne appresso, subinterrupto.*

Long. 28, diam. 8 mill.

12. *CYLINDRELLA PUNCTURATA*, Pfr. *C. testa breviter rimata, pupaeformi, subcylindracea, sursum attenuata, truncata, solida, griseo-albida, nitidula, punctis impressis corneis dense obita; sutura vix impressa, nodis transverse oblongis, candidis, confertis ornata; anfr. superst. 9, planis, ultimo angustiore, antice subascendente, non soluto, ruguloso-striato, basi carina funiformi munito; apertura obliqua, subcirculari, transverse subdilata; perist. albo, expanso, reflexiusculo, superne interrupto, marginibus approximatis.*

Long. 18, diam. $6\frac{1}{2}$ mill.

13. *HELICINA SALLEANA*, Pfr. *H. testa conoideo-subdepressa, tenui, striatula et obsolete subgranulata, diaphana, nitida, purpurascens-fusca; spira conoidea, acutiuscula; anfr. fere 5, convexiusculis, ultimo latiore, periphæria subangulato; apertura parum obliqua, subtriangulari; columella substricta, breviter recedente; perist. tenui, marginibus callo basali lato, semiovali junctis, supero expansiusculo, basali in limbum latum, membranaceum, nigro-rufum reflexo, cum columella angulum formante.—Operc. terminale, subtriangulare, albidum.*

Diam. maj. 9, min. $7\frac{1}{2}$, alt. $5\frac{1}{2}$ mill.

14. *HELICINA OLEOSA*, Pfr. *H. testa depresso-turbinata, tenuiuscula, striatula, diaphana, oleoso-micante, griseo-fulvida; spira conoidea, vix acutiuscula; anfr. 5, convexis, ultimo magno, basi parum convexo, juxta columellam impresso; columella brevi, stricta, subrecedente, filari, callum emittente tenuissimum, subgranulosum; apertura parum obliqua, subtriangulari-semiovali; perist. tenui, breviter reflexo, margine basali cum columella angulum formante.—Operc. solidiusculum, margaritaceum.*

Diam. maj. $7\frac{1}{2}$, min. vix 6, alt. 5 mill.

15. *HELICINA CINGULATA*, Pfr. *H. testa conoideo-globosa, solidiuscula, subconfertim spiraliter striata, opaca, carneo-albida, luteo-bicingulata; spira lutea, convexo-conoidea, apice acutiuscula; anfr. $5\frac{1}{2}$, convexiusculis, ultimo rotundato; columella brevi, verticali, basi subdentata, callum emittente tenuem subcircumscriptum; apertura vix obliqua, semiovali; perist. simplice, recto, margine basali leviter arcuato, cum columella angulum formante.*

Diam. maj. $7\frac{1}{2}$, min. $6\frac{1}{2}$, alt. 5 mill.

16. *CYCLOSTOMA ADOLFI* (CHOANOPOMA), Pfr. *C. testa umbilicata, conoideo-semiglobosa, tenuiuscula, lineis elevatis radiantibus et spiralibus regulariter granulato-decussata, diaphana, fulvida, lineis interruptis rufis cincta; spira convexo-conoidea, mucronulata; sutura irregulariter et remote nodoso-crenata; anfr. 4½, convexis, ultimo rotundato, circa umbilicum medio-crem carinis pluribus munito; apertura subobliqua, circulari; perist. duplice, interno continuo, breviter porrecto, externo patente, concentrice striato, subundulato, rufo-radiato, superne in auriculam fornicatim dilatato.—Operc. testaceum, lamella spirali libera.*

Diam. maj. 8, min. 6½, alt. 4½ mill.

17. *CYCLOSTOMA NOBILE* (TUDORA), Pfr. (Pl. XIII. fig. 2.) *C. testa perforata, ovato-turrita, solida, longitudinaliter confertim filoso-plicata, parum nitida, fusco-violacea; spira elongato-conica, integra, obtusula; sutura confertissime albo-crenulata; anfr. 7, modice convexis, ultimo antice breviter soluto, basi concentrice striato; apertura verticali, irregulariter ovali, intus fusca; perist. albo, duplice, interno breviter porrecto, expansiusculo, externo undique breviter patente; marginibus superne angulatim junctis, columellari levissime arcuato.—Operc. Tudoræ.*

Long. 32, diam. 15 mill.

18. *CYCLOSTOMA CINCLIDODES* (CISTULA), Pfr. *C. testa subimperfata, ovato-oblonga, truncata, solida, lineis spiralibus elevatis et paulo confertioribus longitudinalibus nodoso-clathrata, opaca, fulvido- vel griseo-albida, lineolis interruptis rufis sparse notata; sutura fasciculatim crenata; anfr. superst. 5, convexiusculis, ultimo antice breviter soluto, basi distinctius spiraliter sulcato; apertura vix obliqua, angulato-ovali; perist. albo, duplice, interno porrecto, externo brevissime patente, undulato, superne in angulum producto.—Operc. Cistulæ.*

Long. 11, diam. 5 mill.

19. *CYCLOSTOMA MAGNIFICUM*, Sallé MSS. (CHONDROPOMA), Pfr. (Pl. XIII. fig. 3.) *C. testa perforata, ovato-conica, tenui, longitudinaliter plicato-striata, diaphana, parum nitente, albida unicolore vel tæniis varie interruptis castaneis, media latissima, ex strigis angulatis formata, ornata; spira tumida, apice subtruncata; sutura simplice; anfr. superst. 5, convexiusculis, ultimo rotundato; apertura verticali, ovali; perist. simplice, nitido, albo, castaneo-maculato, superne cucullatim dilatato, ad anfr. penultimum breviter adnato, angustato, ad perforationem sinuato, tum in linguam patentem dilatato, margine dextro et basali fornicatim late reflexis.—Operc. palidum.*

Long. 29, diam. 15 mill.

20. *CYCLOSTOMA LOWEANUM* (CHONDROPOMA), Pfr. *C. testa*

perforata, ovato-turrita, sæpe truncata, tenuiuscula, lineis elevatis spiralibus, confertioribusque longitudinalibus illas transgradientibus (decima quavis vel undecima plerumque validioribus) sculpta, albida, fusco marmorata et irregulariter strigata; sutura dense crenulata; anfr. 7, convexiusculis, 2 ultimis turgidis, ultimo antice soluto, dorso acute carinato; apertura subobliqua, angulato-ovali; perist. simplice, continuo, undique expansiusculo, superne angulatim producto.—Operc. fusco-luteum.

Long. 17, diam. $8\frac{1}{2}$ mill.

21. *CYCLOSTOMA EUSARCUM (CHONDROPOMA)*, Pfr. *C. testa subperforata, ovata, ventrosa, tenuiuscula, longitudinaliter confertissime plicata, vix nitida, diaphana, pallide isabellina, lineis interruptis rufis interdum cincta; spira convexo-conica, breviter truncata; sutura subsimplice; anfr. superst. 4, convexis, ultimo penultimum vix superante, antice brevissime soluto, basi liris nonnullis spiralibus sculpto; apertura vix obliqua, angulato-ovali; perist. simplice, expansiusculo, marginibus superne in angulum acutum junctis, sinistro leviter arcuato.—Operc. normale.*

Long. 13, diam. $7\frac{1}{2}$ mill.

22. *CYCLOSTOMA SIMPLEX (CHONDROPOMA)*, Pfr. *C. testa subperforata, oblonga, truncata, solidula, lineis spiralibus elevatis, longitudinalibusque confertissimis illas transgradientibus sculpta, vix nitidula, pallide aurantiaca, lineis rufis strigatim interruptis picta; sutura subsimplice; anfr. superst. $4\frac{1}{2}$, convexis, lente accrescentibus, ultimo rotundato, basi distinctius spiraliter sulcato, antice subsoluto; apertura verticali, angulato-ovali; perist. simplice, continuo, vix expansiusculo, marginibus superne in angulum productum junctis.—Operc. fusco-luteum.*

Long. $11\frac{1}{2}$, diam. 5 mill.

23. *CYCLOSTOMA HEMIOTUM (CHONDROPOMA)*, Pfr. *C. testa perforata, oblongo-turrita, tenuiuscula, lineis spiralibus obsolete elevatis, longitudinalibusque confertissimis (10–12 in fasciculum junctis) levissime clathrata, non nitente, fusculo-albida, plerumque lineis interruptis rufis et fascia 1 rufa, latiore, infra-mediana ornata; spira subtruncata; sutura confertim denticulata; anfr. 5–7, convexiusculis, ultimo antice breviter soluto, dorso carinato; apertura subverticali, ovali; perist. subduplicato, interno continuo, expansiusculo, externo a medio marginis dextri descendente, breviter patente, medio marginis sinistri in auriculam subundulatam terminato.—Operc. normale.*

Long. 16, diam. $7\frac{1}{2}$ mill.

24. *CYCLOSTOMA BLANDUM (CHONDROPOMA)*, Pfr. *C. testa subperforata, ovato-turrita, truncata, solidula, lineis elevatis spiralibus, confertioribusque longitudinalibus illas transgredi-*

entibus sculpta, diaphana, nitidula, fusco-violacea vel albida, strigis et lineolis rufis irregulariter picta; sutura simplice; anfr. superst. 4, convexis, ultimo rotundato, basi fortius spirally striato; apertura verticali, ovali; perist. albo, duplice, interno breviter porrecto, externo undique horizontaliter et breviter patente, minute undulato, superne angulato-dilatato, ad anfr. penult. breviter exciso.—Operc. normale.
 Long. 18, diam. $9\frac{1}{2}$ mill.

10. DESCRIPTIONS OF FOURTEEN NEW SPECIES OF OPERCULATED LAND-SHELLS, FROM MR. CUMING'S COLLECTION.

By DR. L. PFEIFFER.

(Mollusca, Pl. XIII.)

1. *CYCLOSTOMA LEUCOSTOMUM* (CYCLOPHORUS), Pfr. *C. testa umbilicata, depresso-turbinata, solida, oblique confertissime striata et liris permultis obtusis spiralibus (nonnullis validioribus) sculpta, castaneo-fulva, strigis albis angulatis irregulariter flammulata; spira turbinata, apice obtusula; anfr. $4\frac{1}{2}$ convexis, ultimo circa umbilicum angustum, pervium, albo; apertura parum obliqua, circulari, intus alba; perist. simplice, subincrassato, albo, breviter adnato, marginibus superne subangulatim junctis, columellari subdilatato, patente.*

Diam. maj. 26, min. 21, alt. 16 mill.

Locality unknown.

2. *CYCLOSTOMA AMBOINENSE* (CYCLOPHORUS), Pfr. *C. testa umbilicata, turbinato-depressa, solida, laevigata, castaneo-fulva, guttis albis ad peripheriam fasciam interruptam formantibus aspersa; spira convexo-conoidea, obtusula; anfr. $4\frac{1}{2}$ convexis, ultimo rotundato, basi pallidiore; umbilico angusto, pervio; apertura parum obliqua, subcirculari, intus pallida; perist. simplice, subincrassato, vix expansiusculo, marginibus superne subangulatim junctis.*

Diam. maj. 18, min. 15, alt. 10 mill.

β . *minor. castanea, albida sparse strigata et subfasciata.*

Diam. maj. 14, min. $11\frac{1}{2}$, alt. $8\frac{1}{2}$ mill.

From Amboyna.

3. *CYCLOSTOMA BAIRDI* (CYCLOPHORUS), Pfr. (Pl. XIII. fig. 1.) *C. testa late umbilicata, depressa, subdiscoides, solida, spirally confertim striata, fulvo-lutea, strigis crebris angulatis castaneis picta; spira vix elevata, medio subprominula; anfr. $4\frac{1}{2}$, convexiusculis, ultimo subdepresso, periphæria obsoletissime angulato et fascia castanea ornato; umbilico aperto, $\frac{1}{2}$ diametri paulo superante; apertura obliqua, subangulato-rotundata, intus alba; perist. subsimplice, continuo, breviter adnato, expansiusculo, superne angulatim subproducta.*

Diam. maj. 26, min. 20, alt. 9 mill.

From Ceylon.

4. CYCLOSTOMA BICOLOR (LEPTOPOMA), Pfr. (Pl. XIII. fig. 9.)

C. testa perforata, globoso-turbinata, tenui, sub lente confertissime spiraliter striata, diaphana, albida, castaneo-bifasciata; spira turbinata, obtusula; anfr. 5, convexiusculus, ultimo rotundato, lineis 3-4 distantibus, viz filoso-elevatis munito; apertura obliqua, subcirculari; perist. simplice, subæqualiter angulatim expanso, marginibus callo tenuissimo junctis, columellari leviter sinuato.

Diam. maj. $13\frac{1}{2}$, min. 10, alt. 10 mill.

Locality unknown.

5. CATAULUS PYRAMIDATUS, Pfr. (Pl. XIII. fig. 4.)

C. testa subperforata, ovato-pyramidata, solida, distincte subarcuatim et confertim striata, sericea, saturate castanea; spira turrita, apice acutiuscula; anfr. 7-7½, modice convexis, ultimo non attenuato, basi azin viz excedente; carina basali compressa, antice viz dilatata; periomphalo latiusculo, profundius striato, medio turgido; apertura subcirculari; perist. albo, continuo, breviter adnato, incrassato, horizontaliter patente et reflexiusculo, basi viz producto, canali mediocri, perforato.

Long. 23-29, diam. 10-12½ mill.

From Ceylon.

6. CATAULUS EURYTREMA, Pfr. (Pl. XIII. fig. 5.)

C. testa subperforata, subfusiformi-oblonga, solida, subarcuato-striata, viz nitidula, castanea; spira turrita, apice obtusiuscula; anfr. 8½, convexis, ultimo angustiore, basi oblique supra azin protracto; carina basali valida, compressa, antice sensim tubæ instar dilatata; apertura circulari; perist. carneo, continuo, breviter adnato, incrassato et reflexo, parte sinistra marginis basalis canali magno, subcirculari, retrorsum in rimam filiformem abeunte, perforata.

Long. 26, diam. 10 mill.

From Ceylon.

7. PUPINA NICOBARICA (REGISTOMA), Pfr. *P. testa imperforata, ovato-conica, solidula, glaberrima, nitida, pallide isabel-*

lina; spira convexa, sursum conica, acutiuscula; sutura lineari; anfr. 5, viz convexiusculus, ultimo oblique descendente, antice breviter ascendente, basi rotundato; apertura subverticali, circulari, nodulo calloso minuto juxta insertionem marginis dextri coarctata; perist. simplice, viz expansiusculo, margine columellari subincrassato, incisura brevi, subascendente a basali separato.

Long. 6, diam. 3 mill.

From the Nicobar Islands.

8. HELICINA BULLA, Pfr. *H. testa globoso-conica, tenui, sub lente punctulato-striatula, viz nitidula, diaphana, hyalino-alba; spira mediocri, conoidea, acutiuscula; anfr. 5, planiusculus, ultimo rotundato, antice subascendente; columella brevi, arcuata, extus subnodosa, callum tenuissimum hyalinum retrorsum*

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emittente; apertura obliqua, subtriangulari-semiovali; perist. dilatato, late expanso, margine supero levissime sinuato.

Diam. maj. 13, min. 10, alt. $8\frac{1}{2}$ mill.

Locality unknown.

9. *HELICINA BICOLOR*, Pfr. *H. testa depresso-conoidea, acute carinata, tenuiuscula, striatula et sub lente minutissime punctato-granulata, albida, fasciis 2 fuscis supra et infra carinam ornata; spira brevi, conoidea, acuta; anfr. 5, convexiusculis, rapide accrescentibus, ultimo non descendente, basi convexiore; columella fusca, brevi, subarcuata, dilatata, basi in angulum subspiniformem terminata, callum emittente circumscriptum, fuscum; apertura diagonali, late subtriangulari; perist. dilatato, plano, expanso, intus fusco; margine supero subrependo, basali substricto.*

Diam. maj. $11\frac{1}{2}$, min. 9, alt. 6 mill.

From Tahiti.

10. *CYCLOSTOMA FORTUNEI (CYCLOTUS)*, Pfr. *C. testa umbilicata, turbinato-depressa, solidula, subtiliter striatula, fulva, castaneo minute marmorata et infra medium unifasciata; spira brevissime turbinata, vertice subtili; sutura simplice; anfr. $4\frac{1}{2}$, convexis, ultimo terete, non descendente; umbilico conico, profundo, $\frac{1}{4}$ diametri subæquante; apertura fere verticali, subcirculari, superne leviter angulata; perist. simplice, recto, anfractui penultimo breviter adnato. Operc. calcareum, arcti-spirale.*

Diam. maj. $12\frac{1}{2}$, min. 10, alt. 7 mill.

From Shanghai, China (*Mr. Fortune*).

11. *CYCLOSTOMA LOXOSTOMUM (CYCLOPHORUS)*, Pfr. *C. testa umbilicata, depressa, discoidea, solidula, confertim filoso-striata, fusco-fulva, maculis pallidioribus conspersa; spira plana, vertice subtili haud prominente; anfr. 5, convexiusculis, sensim accrescentibus, ultimo terete, antice dilatato, non descendente; umbilico pateræformi, $\frac{1}{3}$ diametri superante; apertura diagonali, subcirculari, intus margaritacea; perist. continuo, breviter adnato, recto, subduplicato, vix incrassato.*

Diam. maj. $13\frac{3}{8}$, min. 11, alt. 4 mill.

From Ceylon (*Mr. Lear*).

12. *CYCLOSTOMA FORNICATUM (CYCLOPHORUS)*, Pfr. *C. testa umbilicata, sublenticulari, tenuiuscula, lineis elevatis concentricis confertis sculpta, epidermide corneo-virente, vix nitidula induta; spira brevi, fornicata, vertice rubello, obtusulo; anfr. 4, vix convexiusculis, celeriter accrescentibus, ultimo convexiore, medio acute carinato; umbilico profundo, $\frac{1}{3}$ diametri subæquante; apertura obliqua, ovato-circulari; perist. simplice, recto, subinterrupto, marginibus approximatis, columellari subpatente.*

Diam. maj. 9, min. 7, alt. $3\frac{3}{8}$ mill.

From the New Hebrides.

13. *CYCLOSTOMA STRIATULUM* (CYCLOSTOMUS ?), Pfr. *C. testa umbilicata, globoso-turbinata, solida, oblique striatula et lineis concentricis, elevatis, subconfertis sculpta, viz nitidula, flavescenti-albida; spira breviter turbinata, apice obtusiuscula; anfr. 5, convexis, summis lævigatis, ultimo turgido, peripheria obsolete subangulato; umbilico mediocri, profundo; apertura parum obliqua, subangulato-circulari; perist. continuo, breviter adnato, incrassato, expansiusculo, superne angulato. Operculum?*

Diam. maj. $25\frac{1}{2}$, min. 21, alt. 15 mill.

Locality unknown.

14. *CATAULUS THWAITESI*, Pfr. *C. testa viz perforata, subfusiformi-turrita, solida, longitudinaliter confertim costulata, viz nitidula, violaceo-fusca; spira ovato-turrita, apice acutiuscula; sutura impressa; anfr. 7-7½, convexiusculis, ultimo viz attenuato; carina basali validissima, compressa, angulatim patente, alba; apertura verticali, circulari; perist. duplice, albo: interno basi profunde inciso, externo ad anfr. penultimum exciso, cæterum incrassato, reflexo, basi canali mediocri perforato.*

Long. 19, diam. 7 mill.

From Ceylon (Mr. Thwaites).

11. DESCRIPTIONS OF TWELVE SPECIES OF LAND SHELLS, FROM NEW ZEALAND.

BY DR. L. PFEIFFER.

1. *HELIX FLAMMIGERA*, Pfr. *H. testa imperforata, depressa, tenuissima, striatula, nitida, pellucida, lutescente, flammis rubris angulatis regulariter picta; spira convexiuscula, viz elevata; anfract. 3, parum convexis, celeriter accrescentibus, ultimo non descendente, basi planiusculo, medio impresso; apertura diagonali, lunato-rotundata; perist. simplice, recto, margine columellari arcuatim ascendente.*

Diam. maj. 7, min. 6, alt. $3\frac{1}{2}$ mill.

2. *HELIX UMBRACULUM*, Pfr. *H. testa imperforata, sublenticulari, tenuiuscula, striatula, oleoso-nitidula, virenti-cornea, strigis angustis, antrorsum descendentibus, rufis obscure picta; spira convexo-conoidea, apice acuta; sutura marginata; anfr. 5½, planiusculis, acute carinatis, ultimo non descendente, basi convexiusculo, rufo obsolete tessellato; apertura obliqua, depressa, subtriangulari; perist. simplice, acuto, recto, margine basali levissime arcuato, ad columellam brevissime reflexo.*

Diam. maj. $7\frac{1}{2}$, min. 7, alt. $3\frac{3}{8}$ mill.

3. *HELIX PÆCILOCOSTATA*, Pfr. *H. testa perforata, trochiformi, tenui, confertim plicata, fulva, rufo-maculata, diaphana; spira convexo-conica, apice acutiuscula; sutura marginata; anfr. 5½, angustis, convexiusculis, ultimo carinato, non descendente, basi plano; apertura parum obliqua, depressa, angulato-*

lunari; perist. simplice, recto, margine columellari ascendente, calloso-reflexo.

Diam. 4, alt. $3\frac{1}{4}$ mill.

4. *HELIX HELDIANA*, Pfr. *H. testa perforata, minuta, trochiformi, tenui, laevigata, nitida, fulvo-cornea; spira conica, apice obtusa; sutura impressa; anfract. 5, convexiusculis, ultimo carinato, non descendente, basi vix convexiore; apertura vix obliqua, depressa, angulato-lunari; perist. simplice, recto, marginibus remotis, columellari brevissime reflexiusculo.*

Diam. 2, alt. $1\frac{3}{8}$ mill.

5. *HELIX DIMORPHA*, Pfr. *H. testa perforata, depressa, tenui, confertissime striata et subconfertim filoso-costata, parum nitente, diaphana, pallide cornea, minute rufo-tessellata et ad suturam maculis rufis ornata; spira vix elevata; anfract. 5, convexiusculis, ultimo non descendente, rotundato, altiore quam lato; apertura subverticali, lunari; perist. simplice, recto, margine basali subrependo, columellari superne calloso-reflexo, perforationem fere claudente.*

Diam. maj. $8\frac{1}{2}$, min. $7\frac{1}{2}$, alt. 5 mill.

6. *HELIX HYPOPOLIA*, Pfr. *H. testa angustissime umbilicata, depressa, tenui, confertissime costulata, sericea, corneo-cinerea; spira parum elevata, convexa; anfract. $5\frac{1}{2}$, vix convexiusculis, ultimo non descendente, basi convexiore; apertura parum obliqua, late lunari; perist. simplice, recto, margine columellari arcuato, superne vix reflexo.*

Diam. maj. $6\frac{1}{2}$, min. 6, alt. $3\frac{1}{8}$ mill.

7. *HELIX CREBRIFLAMMIS*, Pfr. *H. testa umbilicata, depressa, tenui, striatula, nitida, pellucida, lutea, flammis rufis creberrimis ornata; spira vix elevata, convexiuscula; anfract. $3\frac{1}{2}$, convexiusculis, ultimo non descendente, subdepresso, basi convexiore; umbilico latiusculo, pervio; apertura parum obliqua, lunato-ovali; perist. simplice, recto, margine dextro antrorsum arcuato, columellari vix reflexiusculo.*

Diam. maj. 7, min. $5\frac{1}{2}$, alt. fere 3 mill.

8. *HELIX VARICOSA*, Pfr. *H. testa umbilicata, depressa, tenuiuscula, striatula, costis distantibus varicoso-angulata, haud nitida, fusca; spira vix elevata, obtusa; anfract. $4\frac{1}{2}$ –5, planiusculis, ultimo non descendente, depresso, basi planiusculo; umbilico mediocri, pervio; apertura parvula, obliqua, lunari; perist. simplice, recto, margine columellari superne vix reflexiusculo.*

Diam. maj. $3\frac{1}{2}$, min. $3\frac{1}{4}$, alt. vix 2 mill.

9. *HELIX JEFFREYSIANA*, Pfr. *H. testa umbilicata, depressa, tenui, distincte striata, pellucida, lutea, strigis late costaneis, fasciatim interruptis ornata; spira plana; sutura impressa, regulariter plicatula; anfract. 4, convexiusculis, ultimo sub-*

depresso-rotundato, non descendente; umbilico lato, aperto; apertura vix obliqua, lunato-ovali; perist. simplice, recto, marginibus subconniventibus.

Diam. maj. 7, min. $5\frac{1}{2}$, alt. 3 mill.

10. *HELIX BICONCAVA*, Pfr. *H. testa umbilicata, depressa, confertim arcuato-costata, opaca, corneo-lutescente, rufo-strigata; spira concava; anfract. $4\frac{1}{2}$ -5, angustis, penultimo convexo, ultimo rotundato, non descendente; umbilico lato, perspectivo; apertura subverticali, altiore quam lata, lunari; perist. simplice, recto, margine dextro antrorsum subarcuato.*

Diam. maj. 5, min. $4\frac{1}{2}$, alt. 2 mill.

11. *PUPA NOVOSEELANDICA*, Pfr. *P. testa perforata, subcylindrica, tenui, oblique confertim costata, saturate fusca, maculis stramineis præcipue ad suturam impressam variegata; spira sursum vix attenuata, apice subrotundata; anfract. $7\frac{1}{2}$, convexiusculis, ultimo $\frac{1}{2}$ longitudinis non attingente, rotundato; apertura subverticali, semicirculari, edentula; perist. simplice, recto, marginibus remotis; columellari superne vix dilatato.*

Long. $4\frac{1}{2}$, diam. 2. mill.; apert. $1\frac{1}{2}$ mill. longa.

12. *TORNATELLINA NOVOSEELANDICA*, Pfr. *T. testa oblongo-turrita, tenui, lævigata, nitida, fulvo-cornea; spira turrita, acutiuscula; anfract. 5, convexiusculis, ultimo $\frac{1}{2}$ longitudinis subæquante, basi rotundato; plica parietali profunda, mediocri; columella albo-callosa, alte torto-subtruncata; apertura vix obliqua, subauriformi; perist. tenui, acuto.*

Long. $3\frac{1}{2}$, lat. $1\frac{1}{2}$ mill.; apert. $1\frac{1}{2}$ mill. longa.

This seems to be the species mentioned by Mr. Gray (Proc. Zool. Soc. 1849, p. 167), under the name of *Elasmatina Reclusiana*, Petit, from the island Opara; but its characters are very different from those ascribed by M. Petit to his species.

12. DESCRIPTIONS OF EIGHT SPECIES OF LAND SHELLS, FROM THE ISLAND MAURITIUS.

BY DR. L. PFEIFFER.

1. *HELIX MUCRONATA*, Pfr. *H. testa imperforata, turbinato-depressa, tenuissima, membranacea, oblique rugosula, lineis spiralibus confertissimis sub lente sculpta, pellucida, virenti-cornea; spira parva, conoidea, mucronata; sutura impressa; anfract. 4, rapide accrescentibus, planiusculis, ultimo non descendente, acute carinato, basi convexiusculo; apertura per-obliqua, subrhombea; perist. simplice, acuto, recto, margine columellari usque ad carinam regulariter arcuato.*

Diam. maj. 17, min. 14, alt. 9 mill.

2. *HELIX MAURITIANA*, Pfr. *H. testa subperforata, conoideo-semiglobosa, solida, superne scabre arcuato-rugosa, opaca, unicolore saturate brunnea; spira convexo-conoidea, apice obtu-*

siuscula; sutura leviter impressa; anfract. 6, viz convexiusculis, lente accrescentibus, ultimo acute carinato (carina filari, pallida), basi convexiusculo, radiato-striato, lineis spiralibus confertissimis decussato; apertura diagonali, subsecuriformi; perist. simplice, acuto, margine basali leviter arcuato, columellari calloso-incrassato, subdentiformi.

Diam. maj. 16, min. 14, alt. $8\frac{1}{2}$ mill.

3. *HELIX LIGHTFOOTI*, Pfr. *H. testa subperforata, conoideo-semiglobosa, tenuiuscula, striatula, corneo-albida; spira conoidea, acutiuscula; anfract. 6, convexiusculis, ultimo rotundato, non descendente, medio excavato; apertura obliqua, lunari; perist. simplice, marginibus remotis, supero brevi, recto, basali leviter arcuato, subreflexo, ad columellam tuberculo valido dentiformi munito.*

Diam. maj. $8\frac{1}{2}$, min. $7\frac{1}{2}$, alt. 5 mill.

4. *BULIMUS MAURITIANUS*, Pfr. *B. testa subperforata, subcylindraceo-turrita, tenuiuscula, striata (lineis nonnullis elevatioribus), diaphana, cerea; spira elongata, acutiuscula; anfract. 7, convexiusculis, ultimo $\frac{1}{2}$ longitudinis subæquante, basi viz attenuato; columella substricta; apertura verticali, oblongo-ovali; perist. simplice, recto, margine dextro levissime arcuato, columellari a basi angustissime reflexo.*

Long. 9, diam. 3 mill.; apert. 3 mill. longa, $1\frac{1}{2}$ lata.

5. *TORNATELLINA MAURITIANA*, Pfr. *T. testa ovato-conica, tenui, lævigata, pellucida, cornea; spira conica, obtusiuscula; anfract. $4\frac{1}{2}$, convexiusculis, ultimo inflato, spiram subæquante; lamella parietis aperturalis mediana, compressa, intrante; columella callosa, vitrea, alte dentato-truncata; apertura subsemi-ovali; perist. simplice, acuto, recto.*

Long. 4, diam. $2\frac{1}{2}$ mill.; apert. 2 mill. longa.

6. *CYCLOSTOMA EXPANSILABRE*, Pfr. *C. testa viz perforata, ovato-conica, tenui, sublævigata, parum nitida, pallide lutea, corneo minutissime variegata et fascia 1 rufa infra medium (rarius 2) cincta; spira elevato-conica, apice acutiuscula; anfract. 6, viz convexis, ultimo medio et basi filocarinato; apertura obliqua, ovali; perist. undique subæqualiter breviterque expanso, albo, marginibus subdistantibus.*

Long. $5\frac{1}{2}$, diam. 3 mill.; apert. 2 mill. longa.

7. *CYCLOSTOMA MULTILIRATUM*, Pfr. *C. testa perforata, ovato-conica, solidula, liris elevatis acutiusculis, subconfertis, mediana et basali validioribus sculpta, opaca, rubello-carnea; spira conica, acutiuscula; anfract. $5\frac{1}{2}$, superis subplanis, ultimo convexiore; apertura parum obliqua, angulato-ovali; perist. simplice, recto, marginibus approximatis, columellari superne emarginato, deorsum dilatato, reflexiusculo.*

Long. $8\frac{1}{2}$, diam. 5 mill.; apert. 4 mill. longa.

8. *CYCLOSTOMA GLOBOSUM*, Benson MSS. *C. testa umbilicata, globoso-conica, tenui, subtilissime striatula, diaphana, non nitente, cinnamomea, maculis opacis, albidis, subfasciatim dispositis ornata; spira conica, apice peracuta; anfract. 6, superis vix convexis, ultimo globoso, carina basali subtili, filari; apertura parum obliqua, ovali; perist. simplice, marginibus fere contiguis, dextro perarcuato, columellari medio dilatato, patente.—Operc. tenuissimum, corneo-lutescens, extus concaviusculum.*

Long. 8, diam. 5 mill.; apert. 4 mill. longa, $3\frac{1}{4}$ lata.

These three species belong to a generic type in the family *Cyclostomacea*, for which I propose the name *Omphalotropis*, because all known species have a keel-like ridge round the umbilicus. The species belonging to it are the same which I referred previously to the doubtful genus *Hydrocena*, except the typical species of that genus, *Cyclostoma Cattaroense*, Pfr. (*Hydrocena Sirkii*, Parr.), which, by its amphibious nature and by some differences in the structure of the animal itself, seems to belong to another family. The genus may be characterized by the following phrase: *testa perforata vel anguste umbilicata, globoso-turbinata vel turrita, circa perforationem carinata. Apertura ovalis. Peristoma disjunctum, rectum, vel expansum. Operculum tenue, corneum, paucispirale.*

Its known species are the following:—1. *O. aurantiaca*, Desh. (*Cyclost. Belangeri*, Pfr.); 2. *O. erosa*, Quoy & Gaim.; 3. *O. rubens*, Quoy & Gaim.; 4. *O. multilirata*, Pfr.; 5. *O. globosa*, Bens.; 6. *O. dubia*, Pfr.; 7. *O. expansilabris*, Pfr.; 8. *O. hieroglyphica*, Fér.; 9. *O. pupoides*, Anton.; 10. *O. rosea*, Gould; 11. *O. terebralis*, Gould; 12. *O. vallata*, Gould; 13. ?*O. scitula*, Gould.

13. DESCRIPTIONS OF NINETEEN NEW SPECIES OF LAND SHELLS, COLLECTED BY M. BOURCIER, CONSUL-GENERAL, QUITO. BY DR. L. PFEIFFER.

1. *CYCLOSTOMA (CYCLOPHORUS) BOURCIERI*, Pfr. *C. testa late umbilicata, orbiculata, conoidea, solida, subtiliter striata et lineis elevatis spiralibus, plus minusve confertis sculpta, epidermide fusco-olivacea vestita; spira breviter conoidea, vertice nudo, subpapillato; anfract. $4\frac{1}{2}$ –5, convexis, lente accrescentibus, ultimo terete, antice subdescendente; apertura obliqua, subangulato-circulari, intus margaritacea; perist. simplice, recto, anfractui penultimo breviter adnato.—Operc. tenuissimum, corneum, arctispirale, extus concavum, intus nitidum, medio umbonatum.*

Diam. maj. 19, min. 15, alt. 9 mill.

Hab. prope Mindo, reipublicæ Æquatoris.

2. *CYCLOSTOMA HELICINIFORME*, Pfr. *C. testa obtecte umbilicata, conoideo-globosa, solidula, striatula, parum nitente, virenti-cornea; spira parvula, conoidea, acutiuscula; anfract. 6, convexiusculis, ultimo inflato, antice subascendente, pone columellam*

profunde excavato, calloso; apertura subverticali, angulato-ovali; columella subverticali, retrorsum in dentem acutum desinente; perist. incrassato, albo, undique late expanso, reflexiusculo.— Operc. profunde immersum, rufo-corneum, paucispirale.

Diam. maj. $17\frac{1}{2}$, min. 13, alt. 11 mill.

Hab. in valle Yaraqui, reipublicæ Æquatoris.

This shell is very like a *Helicina*, but the spiral operculum excludes it from that genus, and a subgeneric section of *Cyclostoma* must be formed for it.

3. *CLAUSILIA BOURCIERI*, Pfr. *C. testa vix rimata, fusiformi, solida, sublavigata, opaca, corneo-fusca; spira subturrita, apice obtusa; anfract. 9, planis, ultimo basi rotundato; apertura pyriformi-ovali, intus carnea; lamellis approximatis, supera valida, marginali, infera arcuatim ascendente; lunella nulla (vel imperfecta?); plica palatali 1, elongata, subcolumellari inconspicua; perist. libero, soluto, continuo, carneo, expanso, superne sinuoso.*

Long. $17\frac{1}{2}$, diam. $4\frac{1}{2}$ mill.

Hab. Tunguragua, reipublicæ Æquatoris.

4. *HELIX SELENOSTOMA*, Pfr. *H. testa umbilicata, depressa, tenuissima, undique breviter pilosa, diaphana, fuscula, fasciis pluribus rufis, maculatim interruptis cincta; spira plana, medio subimmersa; anfract. $4\frac{1}{2}$, convexis, ultimo rotundato, antice vix descendente, circa umbilicum angustum, pervium subcompresso; apertura subverticali, rotundato-lunari, intus nitida; perist. tenui, sinuoso, marginibus convergentibus, supero late expanso, basali reflexo, columellari oblique ascendente, superne dilatato.*

Diam. maj. 26, min. 21, alt. 11 mill.

Hab. prope Gualea, reipublicæ Æquatoris.

Another new species from Mr. Cuming's collection, nearly allied to this, from the Andes of New Granada, may be described by the following phrasis:

HELIX CATENIFERA, Pfr. *H. testa umbilicata, depressa, tenui, confertim granulata, diaphana, pallide fuscescente, fasciis variis catenatim interruptis, rufis ornata; spira subplana; anfract. 5, convexiusculis, ultimo ventricoso, antice vix descendente, basi convexo; umbilico infundibuliformi; apertura subverticali, lunato-rotundata; perist. tenui, marginibus convergentibus, supero et basali vix expansis, columellari parum dilatato.*

Diam. maj. $25\frac{1}{2}$, min. 21, alt. 12 mill.

5. *HELIX GUAYAQUILENSIS*, Pfr. *H. testa umbilicata, depressa, discoidea, tenuiuscula, striatula, pallide lutescente, diaphana; spira plana; anfract. 5, planiusculis, lente accrescentibus, ultimo rotundato, antice non descendente, basi fasciis nonnullis opacis, albidis signato; umbilico lato; apertura obliqua, lunato-rotundata; perist. simplicis, acuto, recto, marginibus conniventibus, supero subrependo.*

Diam. maj. 10, min. 9, alt. $3\frac{1}{2}$ mill.

Hab. ad Babahoya, Guayaquil.

6. **HELIX BOURCIERI**, Pfr. *H. testa obtecte umbilicata, conoideo-semiglobosa, tenuiuscula, opaca, nigro-rufescente, strigis fulguratis epidermidis subhydrophanae, ochraceae elegantissime marmorata; spira subconoidea, apice obtusa; anfract. 5, parum convexis, ultimo obtuse angulato, antice perdeflexo, basi subplano, medio impresso; apertura horizontali, transverse oblonga, quadridentata: dentibus 2 subaequalibus superne, et in basi lateris dextri 2 minoribus, approximatis juxta columellam; perist. albo, marginibus callo junctis, supero sinuoso, late expanso, basali late reflexo, supra umbilicum dilatato, appresso.*

Diam. maj. 27, min. 24, alt. 15 mill.

Hab. Otoralo, reipublicae Aequatoris.

7. **HELIX BITUBERCOLATA**, Pfr. *H. testa umbilicata, globoso-depressa, solida, irregulariter striata et minutissime granulata, nitidula, nigricanti-rufa; spira breviter fornicata, apice obtusa; anfract. 4, parum convexis, ultimo angulato, antice rotundato, breviter deflexo, basi inflato; apertura perobliqua, truncato-ovali, intus margaritacea; perist. violaceo-carneo, marginibus subparallelis, supero breviter expanso, basali reflexo, supra umbilicum angustum dilatato, tuberculis 2, approximatis introrsum munito.*

Diam. maj. 22, min. 18½, alt. 12 mill.

Hab. prope Tunguragua, reipublicae Aequatoris.

8. **HELIX ATRATA**, Pfr. *H. testa subobtecte umbilicata, sublentiformi, solida, striata et minute granulata, virescenti-atra; spira parum elevata, vertice obtuso; anfract. 5, planiusculis, sensim accrescentibus, ultimo carinato, antrorsum superne turgido, deflexo, basi versus aperturam saccato; apertura perobliqua; subtrigonolunari; perist. crasso, albo, undique reflexo, marginibus callo crasso junctis, dextro supra basin dente 1, obtuse conico munito.*

Diam. maj. 44, min. 37, alt. 19 mill.

Hab. Puntophaya, reipublicae Aequatoris.

9. **BULIMUS BOURCIERI**, Pfr. *B. testa imperforata, subfusiformi-ovata, solidula, longitudinaliter striata et concentricè subconfertim sulcata, parum nitida, carneo-grisea, obscurius variegata; spira conica, apice acuta; anfract. 6, planiusculis, ultimo spiram paulo superante, basi late et circumscripse carinato; apertura subverticali, subrhombico-ovali, basi angulata; perist. subincrassato, breviter expanso, extus et intus roseo, marginibus callo roseo junctis, dextro leviter arcuato, columellari superne suborto, tum fere rectangule ad angulum basalem procedente.*

Long. 25, diam. 11 mill.

Hab. Pichincha, reipublicae Aequatoris.

10. **BULIMUS FALLAX**, Pfr. *B. testa perforata, oblique ventricosconica, tenui, albida, obsoletissime lutescenti-variegata; spira conica, apice acutiuscula; anfract. 5½, convexiusculis, ultimo spiram subaequantem, irregulariter tumescente, basi oblique producto, compresso, angulato; apertura verticali, subtriangulari; perist. simplice, tenui, expanso, intus albo- vel roseo-labiato, interdum*

tuberculis callosis munito, margine columellari perdeclivi, reflexo, supra perforationem adnato.

Long. 24, diam. 12 mill.

Hab. Tunguragua, reipublicæ Æquatoris.

11. *BULIMUS NYSTIANUS*, Pfr. *B. testa vix perforata, ovato-conica, solidula, scabre striata et punctata, parum nitida, albida, strigis et maculis spadiceis dense variegata; spira conica, acutiuscula; anfract. 6, vix convexiusculis, rapide accrescentibus, ultimo ventricoso, $\frac{1}{2}$ longitudinis subæquante, basi angulatim compresso; columella fusco-violacea, superne recedente, tum arcuatim ad angulum aperturæ subrhombéo-ovalis progrediente; perist. simplice, breviter expanso, margine columellari superne breviter reflexo.*

Long. 32, diam. 15 mill.

Hab. in valle Pomasqui, reipublicæ Æquatoris.

12. *BULIMUS TRICOLOR*, Pfr. *B. testa subperforata, ovata, tenui, striata et minute granulata, olivaceo-fusca, strigis obliquis, interruptis, saturate castaneis fulgurata; spira ventricoso-conica, apice sanguinea, acutiuscula; sutura denticulato-marginata; anfract. 4, supremis 2 planiusculis, ultimis ventricosis, ultimo peroblique descendente, basi attenuato; columella simplice, vix arcuata; apertura parva, spiram vix superante, oblongo-ovali; perist. rufocarneo, subincrassato, vix expanso, margine columellari superne dilatato, reflexo.*

Long. 42, diam. 21 mill.

Hab. Gualca, reipublicæ Æquatoris.

13. *BULIMUS GUTTULA*, Pfr. *B. testa perforata, ovato-conica, tenuissima, striata, pellucida, cornea; spira conica, apice obtusa; anfract. 5, convexiusculis, ultimo spiram paulo superante, rotundato; columella leviter arcuata; apertura obliqua, truncato-ovali; perist. simplice, tenui, breviter expanso, margine columellari fornicatim reflexiusculo.*

Long. 16, diam. 9 mill.

Hab. Gualca, reipublicæ Æquatoris.

14. *BULIMUS CATLOWIÆ*, Pfr. *B. testa subaperte umbilicata, ovato-conica, tenuiuscula, confertim striata, carnea, lineolis fulvidis confertis picta, vel nigro-violacescente, albido-lineata; spira conica, apice acutiuscula, cornea; anfract. 7, convexiusculis, ultimo spira brevior, basi vix compressulo; columella subrecedente; apertura subverticali, ovali-oblonga; perist. simplice, recto, margine dextro leviter arcuato, columellari dilatato, patente.*

Long. 25, diam. 11 mill.

Hab. prope Quito.

15. *BULIMUS CUNEUS*, Pfr. *B. testa imperforata, clavato-turrita, solida, levigata, arcuatim irregulariter substriata, fulva; spira turrita, apice acutiuscula; sutura minute crenulata, linea impressa marginata; anfract. 10, planis, ultimo $\frac{1}{2}$ longitudinis æquante, basi rotundato; columella leviter arcuata, anguste callosa, plana;*

apertura subrhombico-ovali; perist. simplice, recto, margine dextro levissime arcuato, basali cum columella angulum obtusum formante.

Long. 63, diam. 16 mill.

Hab. in ripis fluvii Mira, reipublicæ Æquatoris.

16. *BULIMUS RIPARIUS*, Pfr. *B. testa imperforata, turrita, solida, striata, opaca, straminea; spira elongata, apice obtusiuscula; sutura lineari, confertissime crenulata, non marginata; anfract. 11, lente accrescentibus, planis, ultimo $\frac{1}{2}$ longitudinis non æquante, basi rotundato; columella superne vix torta, tum verticaliter descendente; apertura parva, acuminato-ovali; perist. simplice, recto, margine dextro leviter arcuato, columellari reflexiusculo.*

Long. 53, diam. 11 mill.

Hab. cum præcedente.

17. *BULIMUS ÆQUATORIUS*, Pfr. *B. testa perforata, oblongo-ovata, solidula, irregulariter striata, carneo-albida, fasciis 3-4, latis, cæruleo-nigricantibus, subinterruptis ornata; spira convexo-conica, apice acutiuscula; anfract. 6, convexiusculis, ultimo spira brevior, basi rotundato; columella substricta; apertura subverticali, oblongo-ovali; perist. simplice, recto, margine dextro leviter arcuato, columellari brevi, angulatim late reflexo, patente.*

Long. 34, diam. 17 mill.

β. minor, anfract. 6, fasciatus ut α.

Long. 26, diam. 13 mill.

γ. Albidus, irregulariter castaneo-strigatus.

Long. 32, diam. 16 mill.

Hab. in republica Æquatoris, *α* in monte Schinchulagua, *β* et *γ* ad Chimborazo.

18. *BULIMUS ANTHISANENSIS*, Pfr. *B. testa imperforata, ovato-conica, solidula, rugoso-striata et granulata, sericea, castanea, fulvido et luteo marmorata; spira conica, apice acutiuscula; anfract. 6½, subplanis, ultimo spiram æquante, basi subattenuato; columella callosa, substricta recedente; apertura subverticali, semi-ovali, intus livida; perist. simplice, recto, margine dextro leviter arcuato, columellari superne calloso-dilatato, adnato, albo.*

Long. 40, diam. 17 mill.

Hab. in monte Anthisana, reipubl. Æquatoris, 14,000' supra oceanum.

19. *BULIMUS COTOPAXIENSIS*, Pfr. *B. testa perforata, oblongo-ovata, solidula, striata, lineis spiralibus (infra medium anfract. ultimi evanescentibus) granulato-decussata, sub epidermide fulvo-lutescente, fusco sæpe strigata vel interrupte fasciata, alba; spira convexo-conica, apice obtusiuscula; anfract. 6, parum convexis, ultimo spiram æquante, basi rotundato; columella substricta recedente; apertura parum obliqua, ovali, intus alba, nitida; perist. simplice, obtuso, recto, margine dextro leviter arcuato, columellari dilatato, albo, fornicatim reflexo.*

Long. 24, diam. 16 mill.

β. spira elongata, crebrius fusco-marmorata, lineis spiralibus anfract. ultimi usque ad basin conspicuis.

Long. 35, diam. 15 mill.

Hab. Cotopaxi, reipubl. Æquatoris; var. *β.* in monte Cayembe.

14. DESCRIPTIONS OF EIGHTEEN NEW SPECIES OF LAND-SHELLS,
FROM THE COLLECTION OF H. CUMING, ESQ.

By DR. L. PFEIFFER.

(Mollusca, Pl. XIII.)

1. VITRINA IRRADIANS, Pfr. *V. testa depressa, ambitu subauriformi, tenui, lineis impressis confertim arcuato-radiata, lineis irregularibus spiralibus obsolete decussata, diaphana, viz nitidula, superne cinnamomeo-cornea; spira parvula, subpapillatim elevata; sutura impressa, marginata; anfract. fere 4, planiusculis, rapide accrescentibus, ultimo depresso, basi convexiore; apertura perobliqua, lunato-subcirculari; perist. simplice, tenui, margine columellari regulariter arcuato.*

Diam. $18\frac{1}{2}$, alt. 8 mill.

Hab. in insula Ceylon.

2. VITRINA AMERICANA, Pfr. *V. testa depresso semiglobosa, tenuissima, lævigatissima, nitidissima, virenti-hyalina; spira parvula, viz elata; sutura subcrenolata; anfract. $2\frac{1}{2}$, convexiusculis, celeriter accrescentibus, ultimo subrotundato, subtus latiusculo, anguste membranaceo-marginato; apertura fere diagonalis, lunato-rotundata; perist. simplice, regulariter arcuato, margine supero antrorsum subdilatato.*

Diam. maj. 4, min. 3, alt. 2 mill.

Hab. in Rebuspublicis Fœderatis Americæ Borealis.

Forma persimilis *V. annulatæ*, Stud., testa lævigatissima, apertura obliqua, etc. diversa.

3. HELIX BARRAKPORENSIS, Pfr. *H. testa subperforata, elevato-trochiformi, tenui, striatula, nitida, pellucida, fusco-cornea; spira conica, acutiuscula; sutura profunda; anfract. 6, convexis, lente accrescentibus, ultimo carinato, non descendente, basi convexiusculo; apertura viz obliqua, depressa, subangulato-lunari; perist. simplice, tenui, recto, margine columellari brevi, ad perforationem punctiformem reflexiusculo.*

Diam. $3\frac{1}{2}$, alt. $3\frac{1}{2}$ mill.

Hab. ad Barrakpore, Indiæ (Bacon).

4. HELIX MÜHLFELDTIANA, Pfr. *H. testa latissime umbilicata, subdiscoidea, solida, rugoso-striata, lineis elevatis spiralibus superne decussata, nigricanti-castanea; spira viz elevata, apice obtusissima; anfract. 5, planiusculis, ultimo lato, depresso, acute carinato, antice tumido, profunde deflexo, basi irregulariter compresso; apertura subhorizontali, transverse ovali, intus cærulescenti-alba; perist. simplice, marginibus conniventibus, supero recto, incumbente, basali incrassato, subreflexo.*

Diam. maj. 47, min. 37, alt. 15 mill.

Hab. in Australia.

5. *HELIX DUNKERI*, Pfr. *H. testa umbilicata, perdepressa, tenuiuscula, striata et subtilissime granulata, acute carinata, diaphana, fulva, castaneo-fasciata; spira vix elevata, apice obtusa; anfract. 4½, planis, sensim accrescentibus, ultimo antice angulatum deflexo, basi circa umbilicum mediocrem inflecto, pone aperturam profunde scrobiculato; apertura horizontali, elliptico-pyriformi, dente linguæformi, libero in ventre anfr. penultimi coarctata; perist. continuo, tenui, margine supero expanso, basali reflexo, 4-dentato, dente primo obsoletiore, transverso, juxta umbilicum, secundo erecto, compresso, tertio obliquo cum quarto profundiore basi subjuncto.*

Diam. maj. 22, min. 19, alt. 7½ mill.

Hab. in Andibus Novæ Granadæ.

6. *BULIMUS LARDEUS*, Pfr. *B. testa subperforata, oblongo-ovata, solidula, striata, lardeo-micante, rufo-cornea; spira convexo-turrita, apice obtusa; anfract. 6, convexiusculis, ultimo ½ longitudinis vix superante, basi subcompresso; apertura subverticali, truncato-ovali; perist. intus labiato, subangulatum patente, marginibus remotis, callo tenui juxta insertionem dextri obsoletæ pliciferi junctis.*

Long. 5½, diam. 2½ mill.

Hab. in India orientali.

7. *BULIMUS INCRASSATUS*, Pfr. *B. testa profunde rimato-perforata, ovato-pyramidata, solida, irregulariter plicata et lineis spiralibus sculpta, saturate castanea, strigis et maculis lutescentibus, incrassatis, prominentibus munita; spira conica, acutiuscula; anfract. 7, superis planiusculis, 2 ultimis inflatis, ultimo ¾ longitudinis æquante, basi subcompresso; apertura vix obliqua, oblonga, ad columellam angulato-effusa; perist. simplice, recto, marginibus subparallelis, columellari stricto, dilatato, fornicatim patente.*

Long. 17½, diam. 8½ mill.

Hab. in insulis Galapagos.

8. *ACHATINA CARNEA*, Pfr. *A. testa ovato-oblonga, solidula, striis spiralibus et longitudinalibus (infra medium anfractus ultimi obsoletis) subtiliter decussata, diaphana, sericea, carnea; spira sensim attenuata, apice obtusa; sutura eleganter et confertim denticulata; anfract. 6 convexiusculis; ultimo spira vix brevior, basi subattenuata; columella leviter arcuata, abrupte truncata; apertura verticali, subrhombæo-semilunari; perist. simplice, recto, obtuso.*

Long. 25, diam. 11 mill.

Hab. in America centrali.

9. *DIPLOMMATINA HUTTONI*, Pfr. *D. testa sinistrorsa, subrimata, ovato-conica, eleganter confertim et oblique costulata, diaphana, albida; spira conica, acuta; anfract. 6, perconvexis; apertura subcirculari; perist. duplice, expanso.*

Long. 2½, diam. 1 mill.

This little shell belongs to the genus *Diplommatica*, founded by

Mr. Benson (Ann. and Mag. Nat. Hist. 1849, Sept.) on sufficient characters of the shell and of the animal, for *Carychium costatum*, Hutt., which I had erroneously referred to *Bulinus* under the name *B. folliculus*. The genus seems to belong to the *Auriculacea*.

10. *PTEROCYCLOS CUMINGI*, Pfr. *Pt. testa latissime umbilicata, solida, striatula, nitida, fulvo-lutea, strigis castaneis, fulguratis, bifasciatim latioribus et saturatioribus picta; spira plana; anfract. 5, convexis, ultimo terete, antice juxta penultimum in prominentiam elongatam, fornicatam, sulco circumscriptam tumefacto; apertura parum obliqua, subcirculari, intus margaritacea; perist. simplice, albo, incrassato, reflexo, superne sulco triangulari subinterrupto, in linguam inflexam tenuiusculam producto.—Operculum?*

Diam. maj. 32, min. 28, alt. 6 mill.

Hab. in insula Ceylon.

11. *PUPINA TEMPLEMANI*, Pfr. *P. testa subperforata, subfusiformi-oblonga, solidula, striata, parum nitida, non callosa, castanea; spira oblongo-turrita, apice acutiuscula; anfract. 8 planiusculis, ultimo basi acute et prominenter carinato; apertura verticali, basi subproducta; perist. continuo, aurantiaco, superne breviter adnato, margine dextro sinistroque reflexo-patentibus, basali deorsum dilatato, canaliculato: canali extus lato, intus lineari.—Operculum?*

Long. 20, diam. 7 mill.

β. *Pallide straminea, distinctius striata, perist. crassiore, albo.*

Hab. in insula Ceylon (Capt. Templeman).

12. *CYCLOSTOMA CHRYSALIS*, Pfr. *C. testa umbilicata, distorto-ovata, solida, striatula et punctato-malleata, fusco-carnea; spira irregulariter ovata apice conoidea, acutiuscula; sutura levi; anfract. 6, convexiusculis, penultimo latere aperturali planulato, ultimo angustiore; apertura verticali, circulari; perist. crasso, dilatato, patente, reflexo, margine supero linea horizontali adnato.—Operculum?*

Long. 16, diam. 9 mill.

Hab. Ava.

13. *CYCLOSTOMA (CYCLOPHORUS) BENSONI*, Pfr. *C. testa umbilicata, subgloboso-turbinata, solida, lineis obliquis et confertis spiralibus subtiliter decussata, albido-fulva, castaneo-variegata; spira turbinata, obtusiuscula; anfract. 5, convexis, supremis unicoloribus luridis, sequentibus flammulato-pictis, ultimo magno, obsolete angulato, ad carinam fascia nigricante et utrinque fasciis inæqualibus, castaneis ornato, circa umbilicum angustum, infundibuliformem pallido, subcompresso; apertura parum obliqua, subcirculari, intus lactea; perist. continuo, igneo-aurantiaco, breviter adnato, breviter fornicato-reflexo.—Operc.?*

Diam. maj. 43, min. 34, alt. 26 mill.

Locality unknown.

14. *CYCLOSTOMA BARCLAYANUM*, Pfr. *C. testa obtecte perforata, globoso-conica, solida, longitudinaliter confertim striatula et carinis*

multis acute elevatis munita, violacescenti-fusca, strigis saturationibus et pallidioribus variegata; spira conica, apice obtusa; anfract. 5, parum convexis, ultimo carinis 3 validioribus, prominentioribus munito: maxima mediana, secunda basali, tertia in parte supera; apertura fere verticali, subcirculari, intus livido-sanguinea; perist. sanguineo, subincrassato, expanso, ad anfractum penultimum lunatim emarginato, margine dextro carinis crenulato, columellari fornicato-reflexo, perforationem fere claudente.—Operc. testaceum, 5-spiratum, extus concavum, album.

Long. 29, diam. 23 mill.

Hab. Isle of France (Sir D. Barclay).

This shell is figured by Mr. Sowerby in the 'Thes.' t. 26. f. 118, under the name of *C. carinatum*, var.

15. *CYCLOSTOMA ELATUM*, Pfr. *C. testa umbilicata, conica, tenuiuscula, oblique striata, lineis spiralibus, distantibus, elevatis sub lente munita, vix diaphana, albida; spira conica, acutiuscula; anfract. 5½, parum convexis, ultimo convexiore, subacute carinato, basi confertius reticulato; umbilico angustissimo, non pervio; apertura diagonali, truncato-ovali; perist. simplice, marginibus distantibus, aequalis, angulatim patentibus, columellari subangustato.—Operc. ?*

Diam. maj. 11½, min. 10, alt. 10½ mill.

Hab. in insula Ceylon.

16. *HELIX ZOLLINGERI*, Pfr. *H. testa umbilicata, subconoideo-depressa, tenui, striata, castanea, pallidius variegata, diaphana, nitidula, spira breviter conoidea, obtusa; anfract. 5, vix convexiusculis, ultimo non descendente, acute carinato, subtus convexiusculo; umbilico mediocri, extus infundibuliformi; apertura perobliqua, rhomboidea; perist. simplice, acuto, recto.*

Diam. maj. 17, min. 15, alt. vix 6 mill.

Hab. in insula Java?

17. *HELIX DUPUYANA*, Pfr. *H. testa imperforata, trochiformi, solidula, subcarinata, striis obliquis incrementi et lineis longitudinalibus, confertissimis, impressis subdecussata, sericina, fulva, fasciis 2 angustis, castaneis, altera ad suturam, altera supra carinam obtusiusculam ornata; spira conoidea, vertice obtuso; anfract. 5½, planulatis, ultimo antice breviter deflexo, basi convexiusculo, antice tumido, supra carinam deflexam scrobiculato; apertura perobliqua, subtriangulari, intus margaritacea; perist. simplice, nigro-labiato, marginibus callo nigro-castaneo, supra regionem umbilicalem dilatato, junctis, dextro repando, breviter expanso, basali strictiusculo, reflexo, medio introrsum transverse subdentato, columellari brevi.*

Diam. maj. 32, min. 28, alt. 20 mill.

Hab. in ora orientali Novæ Hollandiæ.

This beautiful shell from Mr. Cuming's collection, already figured in Chemn. ed. ii. t. 124. f. 15, 16, but not described till now, was accidentally omitted in my paper of 1849.

18. CATAULUS LAYARDI, Gray. (*Pupina Templemani*, $\beta.$, Pfr. in Proc. Zool. Soc. 1851.) (Pl. XIII. fig. 6.) *C. testa subperforata, subfusiformi-oblonga, solida, distincte arcuato-striata, pallide straminea; spira oblongo-turrita, apice acutiuscula; anfr. 8, planiusculis, ultimo basi carina elevata, compressa munita, circa umbilicum angustissimum costulato; apertura verticali, subcirculari, basi canali subaperto aucta; perist. continuo, albo, superne breviter adnato, duplice: interno porrecto, externo incrassato-reflexo, basi subangulatim producto, canali extus lato, introrsum angustiore, excavato.*

Long. $17\frac{1}{4}$, diam. medio 7 mill.

Hab. Ceylon.

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